

# The Effectiveness of Homework Tasks in an Irritable Bowel Syndrome Self-Management Programme

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The aim of this study was to evaluate the role of engagement with homework tasks in a brief, self-help CBT based intervention for irritable bowel syndrome (IBS). Thirty one IBS participants who were randomised to receive the self-management programme participated in this part of the study. Participants completed a seven week self-management programme which consisted of a detailed self-help manual that included weekly structured homework tasks, an initial face-to-face session with a CBT therapist, and two hour-long telephone sessions at three and five weeks into the programme. In order to assess improvement across the trial, patients completed questionnaires at baseline, post treatment and three months follow-up measuring the severity of their IBS symptoms and their level of symptom relief. Homework sheets were returned at the end of therapy and rated by two independent raters for quantity and quality of homework completed. There were no significant differences between improvers and non-improvers at the end of treatment in either the quality or quantity of homework completed. However, at three months post treatment people who had symptom improvement had completed significantly more homework during their treatment and the quality of this homework was greater than people who had not improved. Encouraging patients to engage in self-help activities may increase the efficacy of this form of therapy.

Irritable bowel syndrome (IBS) is a chronic, episodic disorder characterised by abdominal pain accompanied by a range of bowel and gastrointestinal symptoms. This symptom complex can include, but is not limited to, diarrhea, constipation - or alternating bouts of both - bloating, nausea, vomiting, excessive wind and an urgent need to defecate (Thompson & Heaton, 2003). IBS is thought to be the most common of the functional gastrointestinal disorders, afflicting up to 20% of adults in the Western world (Ringel, Sperber & Drossman, 2001; Saito, Scoenfeld & Locke, 2002). IBS predominantly affects females with the ratio around 2:1 in non-consulting

populations and 3:1 among those who seek medical care for their symptoms (Latimer, 1983; Rothstein, 2001). As an illness, IBS incurs great costs not only economically but also at the personal level through the pain, suffering and decreases in quality of life the individual can experience.

There is no structural marker or identifiable pathology by which to diagnose IBS so the search for a cause and viable treatment has been problematic (Blanchard, 2001; Thompson & Heaton, 2003). Current consensus recognises that IBS cannot be described in psychological nor physiological terms alone. It is now believed a biopsychosocial

model involving an interaction of psychological, physiological, emotional and behavioural factors best explains the illness. In recent years, cognitive behaviour therapy (CBT) has been recommended as a treatment for IBS as it is thought to be compatible with the biopsychosocial model of this illness (Toner, Segal, Emmott & Myra, 2000). It is suspected that central dysregulation of the brain-gut axis occurs in IBS patients, a process in which cognitive and behavioural factors (such as the way patients interpret and respond to their symptoms), are thought to play an integral role (Mayer, 1999). The cognitive behavioural model assumes that these psychological processes are just as important to symptom experience as are biological processes (Keefe, 1998).

The self-help nature of CBT is thought to be particularly applicable to IBS treatment as it empowers the individual in self-care and symptom management (van der Horst, Schellevis, van Eijk & Bleijenbergh, 1998). Though CBT-based self-help treatments have not been trialed in an IBS population, results have been promising for other illnesses. Kroener-Herwig & Denecke (2002) found CBT in a self-help format to be just as effective as the therapist administered format in reducing headaches and increasing positive changes in coping abilities and self-concept in a pediatric headache group. Both groups were more effective than a wait-list control. Another study found a

CBT based self-help treatment for body dissatisfaction disorder to produce significant improvements in body image and adjustment as face-to-face group CBT sessions (Cash & Lavalley, 1997). Qualitative research also suggests that a self-help strategy would be appreciated by both IBS patients and doctors (Kennedy, Robinson & Rogers, 2003; van der Horst et al., 1998).

A prominent feature of self-help treatment is between session homework. Homework tasks have long played an important role in psychotherapy as they enable the therapist to make use of time between sessions to engage the patient in therapy targeted goals (Kazantzis & Lampropoulos, 2002). The effectiveness of these tasks has been demonstrated in the cognitive behavioural treatment of depression, anxiety, body image disorders, schizophrenia, social phobia and agoraphobia (Addis & Jacobson, 2000; Burns & Nolen-Hoeksema, 1992; Cash & Lavalley, 1997; Edelman & Chambless, 1995; Edelman & Chambless, 1993). A recent meta-analysis found moderate effect sizes for the inclusion of homework tasks and compliance with those tasks (.36 and .22 respectively) on treatment outcome in a sample of 27 studies (Kazantzis, Deane & Ronan, 2000).

We now have good evidence to suggest that the inclusion of homework and compliance with homework tasks leads to improvements in treatment outcomes in CBT interventions. However, some questions remain unanswered. An important issue that has been largely overlooked in the homework literature is that of quality versus quantity (Kazantzis, Deane & Ronan, 2004; Primakoff, Epstein & Covi, 1986; Schmidt & Woolaway-Bickel, 2000). That is to say, there may be differences between those participants who carefully adhere to homework assignments and those who complete tasks, but incorrectly. One study that has attempted to map the individual effect of homework quality on treatment outcome looked at CBT for panic disorder (Schmidt & Woolaway-Bickel, 2000). It was found that therapist and independent rater estimates of homework *quality* were better predictors of treatment outcome than quantity. The authors

suggest that in examining the quality of homework tasks, we may be able to tap into the individual's depth of emotional processing.

Additionally, it appears there has been no attempt to monitor the role of homework within the self-help therapy format. As Kazantzis et al. (2004) outline, there are a number of factors for consideration in the collaborative assignment of homework in face-to-face therapy to ensure compliance. In self-help therapy, where homework is largely designed to be set and carried out independently, barriers to homework completion may be inevitable.

The principle aim of this study was to evaluate the role of engagement with homework tasks in a brief, self-help, CBT based intervention for IBS. In particular, we were interested in looking at the possible benefits of both quantity and quality of homework. It was hypothesised that treatment group participants who had a greater level of engagement measured by the quality and quantity of their homework tasks, would experience greater relief from their IBS symptoms than those who were less engaged.

## Method

### Participants

Participants were recruited from a large prospective study at the University of Auckland which looked at recovery from infections. Patients who met self-report criteria for IBS at six months post-infection ( $n = 145$ ) were invited to be screened for possible participation in the current treatment trial. An additional 10 participants, who presented to the student health centre with newly diagnosed IBS symptoms, were invited to participate by the medical officer involved.

Participants were included in the study if they met criteria for IBS based on the Rome I and/or II criteria (Brandt et al. 2002), the results of their diagnostic tests indicated no alternate explanation for their symptoms, they had been diagnosed within the past year, and were between the ages of 18 and 80 years. Participants who suffered from other medical conditions that had potential to affect their symptoms (i.e. coeliac disease, Chron's disease

etc.) or who suffered from a serious psychological disorder were excluded from the study.

One hundred and fifty five participants were offered screening for this study. Screening involved a full IBS work up with a general practitioner who worked in consultation with a specialist gastroenterologist. Of these, 1% were unable to be scheduled for a medical screening, 8% had moved out of the area, 22% were not experiencing symptoms at the time of recruitment, 9% were out of the required age bracket and 2% had obvious self-reported medical exclusions. The remaining 85 potential participants underwent medical screening for the study and a further 21 were excluded on various medical grounds. The 64 individuals identified as eligible to partake in the study were randomized into either a treatment or a control group. Randomisation was achieved by placing equal numbers of the letters S (self-management) and C (control) in 70 separate, sealed opaque envelopes which were randomly mixed together. As each new subject entered the study, an independent administrator opened an envelope and allocated the participant to the appropriate group.

This study includes only the 31 patients who were randomized to the treatment group. Of these, 74% were female, 90% were European and 62% had completed Tertiary level education. The ages of participants ranged from 19 to 77 with a mean age of 39 years. Participants had experienced IBS symptoms for an average of two years and four months ranging from three months to fifteen years.

One participant did not complete the treatment but did complete each of the follow-up questionnaires. One participant pulled out at post-treatment due to work commitments. At three months post-treatment a further participant moved overseas and was not able to complete any more questionnaires. Consequently, 97% of the treatment group completed post-treatment (8 week) questionnaires, and 90% three month follow-up questionnaires.

### Outcome measures

**Global rating of improvement.** The primary outcome measure was the

participants' self-rating of improvement as measured by the Subject's Global Assessment of Relief (Muller-Lissner et al., 2003). This measure was developed as a primary assessment of outcome in clinical studies of IBS with the intention of identifying responders to therapy. Participants were asked to respond to the question 'Please consider how you felt this past week in regard to your IBS, in particular your overall well being, and symptoms of abdominal discomfort, pain and altered bowel habit. Compared to the way you usually felt before entering the study, how would you rate your relief of symptoms during the past week?' Participants were then required to rate their relief on a scale of one to five possible answers ranging from "completely relieved" to "worse". Scores were dichotomized to give two variables indicating improvement and non-improvement on this measure with patients rating themselves as "relieved" and "completely relieved" considered to be improved and "somewhat relieved" to "worse" as not improved.

**Symptom severity.** The IBS-Symptom Severity Scale (Francis, Morris & Whorwell, 1997) was used to assess improvements in symptom severity. This measure was designed for use in both clinical practice and therapeutic field trials. There are five questions in all regarding pain, distension, bowel dysfunction and quality of life/global well being on which participants are prompted to indicate severity for each on a visual analogue scale. Scores range from 0-500 with 500 indicating the greatest severity. Scores below 75 are thought to indicate remission while a change in score of 50 points indicates clinical improvement (Francis et al., 1997). Scores were dichotomised into improvement and non improvement with a change in score of 50 points or more indicating improvement.

#### *The treatment manual*

The manual was written specifically for this trial and was designed as a tool to be used in health care where there are restrictions on therapist time and training. It was also targeted for a primary care IBS population and was aimed at common IBS issues reflective of this group. The CBT model was based in part on work conducted by

Toner et al. (1998 & 2000), Blanchard (2001) and Boyce, Gilchrist and Talley (2000). Following a brief introductory chapter to the manual, the body of the manual consists of six chapters each corresponding to one week's work. The topics covered in each of the six weeks of the treatment were as follows; irritable bowel syndrome explained, assessing symptoms & self-monitoring, managing IBS symptoms, cognitive restructuring, personal expectations & activity patterns, relaxation and stress management, and maintenance. Each of these chapters was task oriented, tackling a different area of IBS and its management. Homework tasks were set around the central themes of each chapter and were aimed at encouraging the patient to initiate management strategies in their lives.

#### *Development of an IBS homework assessment tool*

An IBS homework assessment tool was developed to assess the contribution engagement with homework tasks had on treatment outcomes. The quantity of homework was assessed by simply summing the number of homework sheets completed out of a possible total of 10. In accordance with Schmidt and Woolaway-Bickel (2000), homework quality was assessed by first generating an ideal formulation for each of the homework tasks. For example, in week three treatment participants were asked to set goals around bowel symptom management. An example of a goal might have been, "I will not spend longer than 5 minutes straining on the toilet each morning". An ideal answer for this goal would be that a) the goal was specific to time, place, frequency and that all of these variables were made clear; b) the participant drew on examples given in manual; c) the participant set realistic goals for each area, and, d) the participant completed the task.

#### *Procedure*

Following the completion of the medical screening and baseline assessments, eligible participants were randomised to either the treatment or standard care control groups. Treatment group participants were invited to meet with the cognitive behavioural therapist (RM) for an initial one hour session.

This served as an introduction to the self-help manual and enabled each patient an opportunity to voice any major problem areas or concerns about their IBS. The therapist explained how to use the manual, described the rationale for the programme and gave an overview of the research based model of IBS including an explanation of symptoms. Two further phone sessions were organised at this time for weeks three and six of the programme.

Patients were sent questionnaires by the manager of the trial (LB) to assess their levels of improvement at the end of treatment (8 weeks after the start of treatment) and at three months after the end of treatment.

The collection of homework was carried out as follows. Each participant was contacted by LB at the completion of their seven-week treatment and reminded to return all homework sheets in the freepost, self-addressed envelop included in their treatment package. A copy was made of each of the returned homework sheets and the originals were returned to the participant for their own reference. At this stage, the homework sheets were coded using the homework assessment coding scheme. As LB had met all study participants when they had their initial medical screening, an additional independent investigator who was not involved in the study also participated in the marking of homework. This was done to ensure there was no bias in marking and also to assess inter-rater reliability. Participants' homework was identifiable by their code number only. The homework sheets of four participants were rated together initially so as to ensure consensus in rating. The remainder of the homework was rated individually. The inter-rater reliability was .64 which is lower than the suggested kappa of .7. As such, any discrepancies were re-rated by both raters together. Twenty-four out of 31 treatment group participants returned their homework, a response rate of 77%.

#### *Data analysis*

Statistical analysis was carried out using SPSS (Statistical Package for Social Science) version 11. The

significance level was set at .05 for each statistical test. A series of logistic regressions were used to assess the homework hypotheses. In each of these, the improvement variable was the dependent variable and quantity or quality of homework was the independent variable. Bivariate correlations were also carried out to assess whether a relationship existed between homework variables.

**Results**

Our hypothesis was that treatment group participants who had a higher level of engagement in CBT homework tasks would experience greater relief from their IBS symptoms. Two separate logistic regressions were conducted for people who had improved or not improved on both the SGA of Relief

and the IBS-SSS at the post-treatment and three months post-treatment follow-up periods. The mean scores on homework quantity and quality are presented in Table 1.

The logistic regression shows that there were no significant differences between improvers and non improvers post treatment using either the SGA of Relief or the IBS-SSS on quantity of homework (see Table 2). However, at three months follow-up improvers on both the SGA of Relief and the IBS-SSS had completed a greater quantity of homework sheets during their treatment than non-improvers.

There was no significant difference between improvers and non-improvers at post-treatment on the SGA of Relief in terms of quality of homework completed but at three months post-

treatment the difference between groups was approaching significance. Similarly, there was no difference between IBS-SSS improvers and non-improvers on quality of homework at post-treatment, but improvers at three months post treatment had significantly higher homework quality scores than non-improvers.

*Assessing the relationship between homework variables*

A bivariate Pearson correlation was computed to assess whether there was a relationship between the overall quality of the homework sheets and the quantity of homework completed. The correlation co-efficient was .86 ( $p < .001$ ) suggesting that there was a strong linear relationship between the quality and quantity ratings of the homework.

Table 1. Mean scores on homework quantity and quality for improved vs. non-improved on the IBS-SSS and SGA of Relief.

	Subject's Global Assessment of Relief		Irritable Bowel Syndrome-Symptom Severity Scale	
	Improved (n=13)	Not Improved (n=11)	Improved (n=17)	Not Improved (n=7)
<b>Quantity</b>				
Post-treatment	7.46(2.59)	6.32(2.72)	7.26(1.96)	6.14(3.98)
3 Months	7.96(1.96)	5.33(3.05)	7.81(1.88)	4.42(3.29)
<b>Quality</b>				
Post-treatment	21.66(9.71)	21.73(11.08)	22.98(8.09)	18.57(14.24)
3 Months	25.00(9.01)	17.28(10.40)	24.84(8.01)	13.83(11.53)

Note: Quantity = number of homework tasks completed out of 10. Quality = score out of a possible total of 40.

Table 2. Logistic regression analyses predicting improvement and non-improvement on the IBS-SSS and SGA of Relief given quantity and quality of homework completed.

	Post-treatment			Three Months Post-treatment		
	Odds ratio	95% C.I.	P	Odds ratio	95% C.I.	P
<b>Improved vs. non-improved</b>						
IBS-SSS						
Quantity	0.85	.61-1.19	0.35	0.57	.35-.95	0.03
Quality	0.96	.87-1.05	0.33	0.87	.76-.10	0.04
SGA of Relief						
Quantity	0.84	.61-1.17	0.3	0.64	.41-.99	0.05
Quality	1	.923-1.09	0.99	0.92	.82-1.02	0.1

## Discussion

The results from this study support the use of structured homework tasks in a brief, self-help CBT based intervention for IBS. Participants who had higher levels of engagement in their homework tasks were more likely to report clinically significant improvements in their overall condition and symptoms at three months follow-up. Higher scores on both the quantity and quality of homework were related to decreases in symptoms and increases in self-rated improvements at three months post-treatment. Interestingly, these differences were not apparent immediately post-treatment. This may suggest that engagement in homework tasks may facilitate continued improvement in symptoms through encouraging ongoing adherence with cognitive behavioural self-management strategies.

The results of this study replicate the meta-analysis carried out by Kazantzis et al. (2000) in that compliance with self-help tasks appears to have a positive impact on treatment outcome. However, the homework effects seen in this study were not as significant as those found in the Kazantzis et al. (2000) meta-analysis. One of the reasons for this may be that the majority of treatment group participants in the current study improved (96.2%). This means that even though the SGA of Relief categories were conservatively dichotomised, there is unlikely to be extreme differences between improvers and non-improvers on these variables. Additionally, a low return rate (77%) and the natural attrition of participants at the final follow-up may have decreased the power to detect a difference between improvers and non-improvers on these variables. Indeed, a study by Kazantzis (2000) found most homework trials were not sensitive enough to detect effect sizes likely to be found when examining homework effects. Kazantzis (2000) evaluated the power of homework research and found that, on average, power levels were fairly weak, ranging from .58 for a large effect size, to .09 for a small effect size. Additional to this, the study conducted by Edelman and Chambless (1995) found participants

in the homework condition showed greater improvements over time than those in the non-homework condition. Taking these factors into consideration, it is thought that the trend in the current study for homework quantity and quality to increase from post-treatment to three months would be continued at six months.

The strong correlation found between quantity and quality suggests there may be issues for contention as to the divisibility of these factors. In the study carried out by Schmidt and Woolaway-Bickle (2000) a similar outcome was found. The authors suggested that the variables quantity and quality may be measuring an underlying factor of motivation. However, another study carried out by Burns and Nolen-Hoeksema (1991) looking at the effect of homework compliance on the recovery from depression found that scores on a Willingness scale made a separate contribution than compliance with homework tasks to clinical improvement. The fact that quantity in the current study was most consistently associated with significant treatment outcomes suggests that the most important factor may be how much patients engage in the process rather than their abilities when engaging in the specific exercises. This information could be used to encourage patients not to be overly concerned about their abilities on the given tasks, as just attempting the exercises may be helpful.

There are several limitations to consider in this study. As mentioned earlier, the small sample size may have affected the power to detect significant homework effects. It is thought that a formalised collection process, such as computer based homework recording, may ensure the return of a greater proportion of homework sheets than attained in this study. As homework collection started late in the trial it was difficult to ensure a 100% return rate. When contacted up to six months after completing treatment, some of these participants had invariably misplaced or thrown out their homework sheets.

One of the factors influencing the low homework return rate may have been a pressure felt by participants to

complete their homework in a socially desirable way. Indeed, in a review by Kazantzis and Lampropoulos (2002) it was noted that the majority of therapists found the term "homework" problematic due to its association with negative evaluation and concerns about perfectionism. It is suggested that neutral labels such as "task" or "exercise" be used in its place Kazantzis & Lampropoulos (2003).

Finally, this was a correlational study and, as such, it may not be conclusive that homework compliance led to symptom improvement. It must also be considered that symptom improvement may facilitate greater homework compliance. Future research in this area would benefit from including a non-homework control to better address this question.

Despite these limitations this study is the first of its kind to examine the effects of homework compliance in a self-help therapy format. It is also one of the few studies to look at the separate effects of quality and quantity of homework. The results of this study are a promising step forward and suggest that encouraging patients to engage in self-help activities may increase the efficacy of this form of intervention.

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