Article

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Self-help relaxation for post-stroke anxiety: a randomised, controlled pilot study

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Abstract

Objective: To consider relaxation as a potential treatment for anxiety in stroke survivors living in the community, including feasibility and acceptability.

Design: Randomised two group design (intervention and control).

Participants: All participants (n = 21) were stroke survivors living in the community who reported experiencing anxiety (Hospital Anxiety and Depression Scale - Anxiety Subscale $\geqslant$ 6).

Interventions: The intervention group were asked to listen to a self-help autogenic relaxation CD, five times a week, for at least one month. Participants completed the Hospital Anxiety and Depression Scale at screening and then monthly for three months.

Results: At each assessment following screening, participants who received the relaxation training were significantly more likely to report reduced anxiety compared to those who had not received the training (Month 1 P = 0.002; Month 2 P < 0.001; Month 3 P = 0.001). After one month, seven of the intervention group (n = 10) had completed the relaxation training as directed and planned to continue using it. The intervention appeared practical to deliver and relatively inexpensive, with minimal adverse effects.

Conclusions: Preliminary evidence suggests that autogenic relaxation training delivered in a self-help CD format is a feasible and acceptable intervention, and that anxiety is reduced in stroke survivors who received the intervention. Future studies should seek to recruit a larger and more heterogeneous sample of 70 participants.

Keywords

Stroke, anxiety, self-help relaxation

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Introduction

Anxiety following stroke is a common and persistent problem. A review of 44 studies concluded that prevalance rates ranged between 18-25%.[1] Anxiety also persists in a high proportion of cases. Aström[2]

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for instance found that only 23% of stroke survivors with 'early' anxiety (an anxiety disorder diagnosed in the first three months post-stroke) had recovered after one year. Longer-term follow up has found prevalence rates of 31-38% in the ten years following a stroke, with anxiety associated with lower quality of life.[3]

At present there are no recommended treatments for post-stroke anxiety,[4] making the development and evaluation of suitable interventions a priority. One possibility is relaxation, given evidence of its effectiveness in reducing anxiety in other populations, including older people and those with physical health complaints.[5] It is thought to work by creating a physical state antithetical to the stress response associated with anxiety.[5] Preliminary findings in stroke survivors are promising with regards to impact on tension, motivation and quality of life in post-acute and rehabilitation settings.[6,7] As yet no research has considered the potential of these techniques to treat anxiety. Although there are many types of relaxation, autogenic relaxation (an imagination-based technique) is thought to be particularly promising for use with stroke survivors.[7] More physically based forms of relaxation, such as progressive muscle relaxation, may not be suitable due to the disability common post stroke.

This research aimed to trial autogenic relaxation as a treatment for anxiety in stroke survivors living in the community, by comparing the outcomes for those who received a self-help CD, with those in a control group. It was expected, given the success of such relaxation in other populations, that those receiving the treatment would report reductions in anxiety, relative to controls, and the intervention would be feasible and acceptable.[8]

Methods

Ethical approval was granted by the Faculty of Arts and Human Sciences at the University of Surrey, UK.

An advert was circulated to 97 stroke survivor groups across the UK and placed in a national stroke survivor publication. It invited stroke survivors experiencing anxiety and living in the community to contact the lead researcher. All potential participants gave written consent and were then screened, via telephone, using assessments of mood (Hospital Anxiety and Depression Scale (HADS))[9] and cognitive ability (Telephone Interview of Cognitive Status (TICS))[10], as well as a brief patient history.

The HADS is a 14 item self-report rating scale divided into two subscales: anxiety and depression. Each item is rated for the past week on a four point Likert scale ranging from zero to three. In this study we focus solely on the Anxiety subscale. A lower than normal cut-off on the HADS Anxiety subscale was used ($\geqslant 6$), as this is recommended as most sensitive in a stroke population.[11]

The TICS is an examiner-administered measure of cognitive functioning, which can be conducted via telephone. It consists of 11 items including word list memory, orientation, attention, repetition and conceptual knowledge.

Exclusion criteria included inability to complete the rating scales via telephone; for example deafness, moderate to severe cognitive impairment (indicated by a score $\leqslant 20$ on the TICS), significant difficulties with language or non-English speaking. Participants who reported a co-morbid psychiatric disorder other than an affective disorder (such as a psychotic disorder or dementia) were also excluded, as were as participants who were currently receiving another psychological intervention.

Following screening, participants were randomly assigned to either the intervention or control group. This was achieved using a random number generator and pre-filled envelopes, in chronological order during screening, with the researcher unaware of group assignment at this stage.

The intervention group were sent a one month diary sheet and self-help autogenic relaxation CD[12] and asked to follow the instructions on it five times per week for a month, and record how frequently they listened to the CD using the diary. After the first month participants chose whether to continue using the CD. Those in the control group received the CD after three months.

The training was approximately 20 minutes in length and asked participants to be aware of various aspects of the body and to experience them in particular ways (such as heavy, warm or refreshed). For example, the script states "Focus your passive attention on whichever of your arms is most active

and repeat the following 'My arm is heavy. My entire arm and hand and fingers are very heavy and limp and relaxed'".[12]

One, two and three months after screening, all participants completed the HADS, via telephone with the lead researcher. At month one the intervention group were also asked how regularly they listened to the CD in the first month, whether they planned to continue using it and to comment on their experience of using the CD. Consequently, the researcher was not masked to group allocation at this stage, due to the differences in follow-up procedures between groups.

Analysis

Descriptive statistics (mean, SD and range) were calculated for each group, at each time point. Change in anxiety scores were calculated for each participant at one, two and three months after screening, by subtracting the follow up score from the screening score. Positive numbers indicate a reduction in anxiety.

Given the small sample size a conservative analysis approach was adopted, using non-parametric statistics.[13] Independent samples Mann-Whitney U tests were used to investigate whether any differences existed between the two groups with regard to change in anxiety. All participants who had completed the relevant questionnaires at each time point were included in the analysis for their randomly assigned group (intervention or control), regardless of whether or not they reported listening to the CD five or more times per week for a month. This approach was chosen as it is thought to be ecologically valid. All data analyses were carried out using SPSS Version 20.0.[14]

Comments made by participants were recorded verbatim and transcribed. However, given the limited number and length of these comments, it was not considered appropriate to conduct any form of qualitative analysis.

Results

Twenty-four people responded to the advert, gave written consent and were screened. Three people did not meet the inclusion criteria regarding anxiety. No one was excluded on the basis of the exclusion criteria.

One participant in the intervention group withdrew in the first week, due to personal reasons. She was not included in the statistical analyses, leaving twenty participants. Another withdrew from the intervention group after one month, due to additional health concerns. His data were included at month one, but not in the analyses at month two and three. No one withdrew from the control group. Figure 1 shows a flow diagram of this procedure. Information regarding participant characteristics at screening is shown in Table 1. The mean and standard deviation of the anxiety subscale score (HADS-A) were calculated for each group at screening, month one, month two and month three (see Table 2), along with the change in anxiety scores (see Table 3).

After one month participants who had received the relaxation training were significantly more likely to report reduced anxiety since screening, compared to those in the control group ($U = 10.0$, $z = -3.048$, $P = 0.002$, $r = -0.682$). The same pattern was found at month two ($U = 5.000$, $z = -3.307$, $P < 0.001$, $r = -0.759$); and month three ($U = 8.500$, $z = -3.028$, $P = 0.001$, $r = -0.694$). By month three, four of the intervention group ($n=9$) were no longer considered to have clinical levels of anxiety,[11] compared with one in the control group ($n=10$).

Seven participants from the intervention group ($n=10$) reported having used the CD as directed, at least five times per week for a month. One participant had listened to the CD between once and four times per week and two listened to the CD less than once a week over the course of the month. Seven participants reported that they planned to continue using the technique, although these seven were not necessarily those who had used the CD as directed.

Comments on the intervention were generally positive, for example "I found it very relaxing"; "I found the tapes extremely helpful"; "I liked the fact you could do it in your own time and in your own home"; "I found it easy to do". One participant reported that the training made their "eyes feel funny"; no other adverse events were described. Another reported that they "couldn't get [their] head around it" and another had been unable to find time to listen to the CD. One made comments about being unable to do all of the exercise because of a physical impairment.

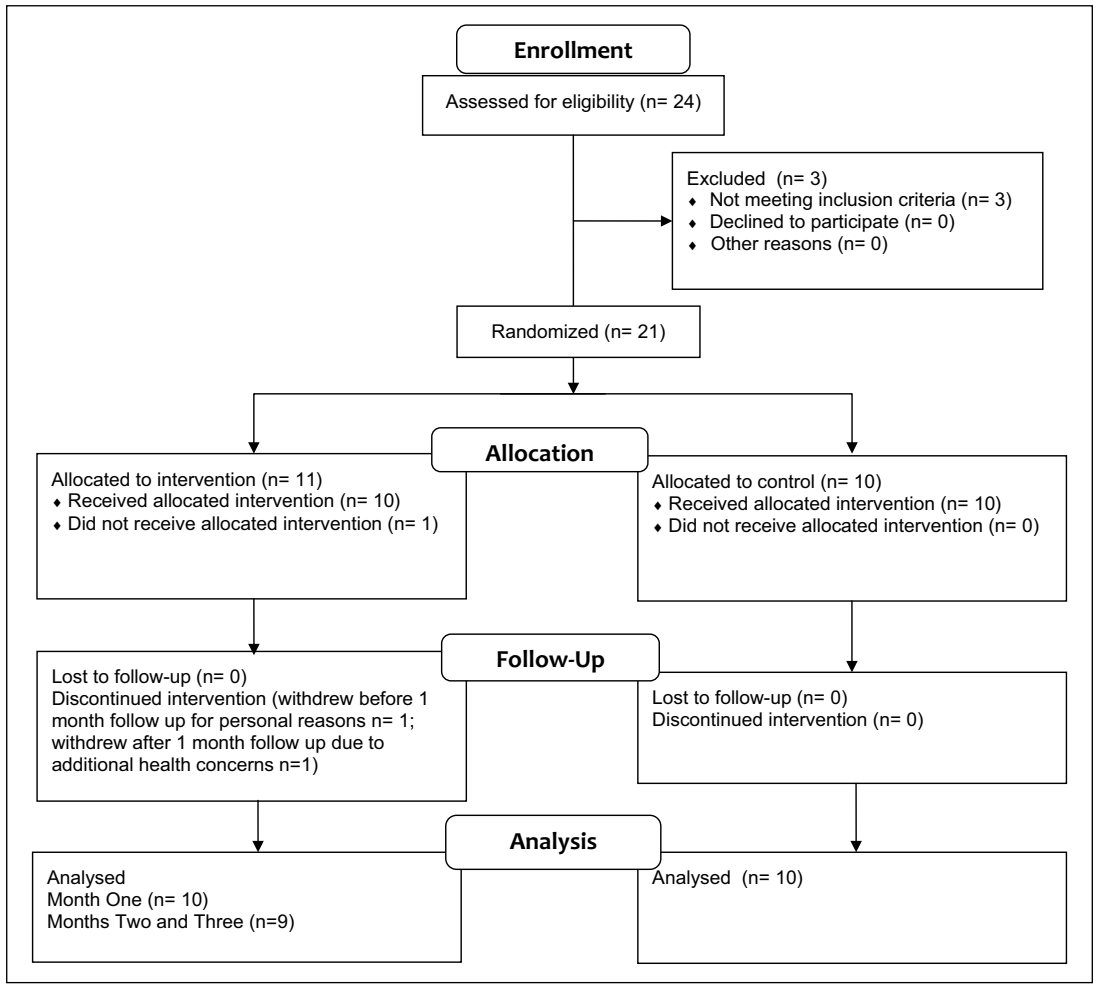

Figure 1. Flow diagram showing procedure of recruitment, allocation, follow-up and analysis.

With regard to the amount of contact, each participant received approximately 60 minutes of telephone contact across the four assessments (30 minutes for the initial screening, followed by 10 minutes for each subsequent call). None of the participants sought additional telephone contact during the study.

Discussion

This pilot study provides preliminary evidence that autogenic relaxation training delivered in a self-help format may reduce anxiety in stroke survivors living in the community. This is in line with previous research suggesting that autogenic relaxation training is an effective treatment for anxiety in older people and those with other physical health complaints.[15,16] Nevertheless, five of the nine participants in the intervention group remained in the clinical population for anxiety by month three, and the group mean remained above the clinical threshold[11] throughout.

Feasibility

Feasibility was considered in terms of the practicality of delivery, time implications, and costs. No practical issues arose around the administration of the self-help CD. The CDs were delivered by post and participants reported no difficulties with

Table 1. Participant characteristics at screening, by group.

	Intervention (n = 10)			Control (n = 10)		
	Mean	SD	Range	Mean	SD	Rang
Gender	6 males, 4 females			5 males, 5 females		
Age	67.8	7.480	61–82	62.4	8.356	49–76
Time since stroke (months)	118.1	101.485	11–317	69.9	69.875	5–228
HADS-A	10.9	3.446	7–19	10.5	3.504	6–16
HADS-D	8.2	3.882	3–14	9.4	3.596	5–15
TICS	29.9	3.725	25–36	31.1	3.784	23–35
Current use of psychiatric medication	5			5		
History of psychological therapy	5			5		

HADS-A: Hospital Anxiety and Depression Scale – Anxiety Subscale, HADS-D: Hospital Anxiety and Depression Scale – Depression Subscale, TICS: Telephone Interview of Cognitive Status.

Table 2. HADS-A at screening, month one, month two and month three, for the intervention and control groups.

	Intervention[a]			Control (n = 10)		
	Mean	SD	Range	Mean	SD	Range
Screening	10.90	3.446	7–19	10.50	3.504	6–16
Month 1	7.40	4.502	3–18	10.60	3.893	7–20
Month 2	7.00	4.664	2–17	11.40	3.893	6–17
Month 3	6.89	4.859	3–18	11.00	3.887	5–19

HADS-A: Hospital Anxiety and Depression Scale – Anxiety.
[a]n = 10 for the intervention group at screening and month 1, n = 9 at month 2 and 3.

Table 3. Change in HADS-A between screening and months one, two and three, for the intervention and control groups.

	Intervention[a]			Control (n = 10)		
	Mean	SD	Range	Mean	SD	Range
Month 1	3.50	2.173	1–7	−0.10	2.183	−4–4
Month 2	4.11	3.371	0–10	−0.90	2.079	−6–2
Month 3	4.22	3.232	1–9	−0.50	2.506	−3–5

HADS-A: Hospital Anxiety and Depression Scale – Anxiety.
[a]n = 10 for the intervention group at month 1, n = 9 at month 2 and 3.

listening to the CD on their own CD players. During the one hour of participant contact time there were no disclosures which were concerning and no requests for additional support.

Another aspect of feasibility is the financial implication of offering the treatment. The CD and associated costs (posting and packaging) were £1 (~US$1.50) per participant. Including additional costs (such as telephone contact time and overheads for initial screening) each intervention costs £25 (~US$38) per stroke survivor (if delivered by an Assistant Psychologist in a stroke service; using economic modelling data from a stroke psychology service).[17] This cost estimate is in line with that calculated for therapist-guided use of self-help books or a psycho-education group for anxiety (£36-£150 (~US$55–$227) per person).[18] It is encouraging that this intervention falls within the lower end of the current range of treatment costs for anxiety.

Acceptability

Recruitment, retention and adherence rates, as well as participant comments, provide information about the acceptability of the intervention and research design to participants. The low recruitment rate (as indicated by the small sample size) might suggest that stroke survivors who experience anxiety do not consider this treatment or research study acceptable. Unfortunately, it is unclear whether this uptake is typical; earlier research[6,7] has been based exclusively in hospital or outpatient settings, where stroke

survivors are already in contact with the healthcare professionals who are recruiting them.

Furthermore, participants were being asked to trial a novel and untested (in stroke survivors) intervention. Crucially it would be wrong to assume that this would necessarily reflect the uptake if this treatment was adopted in a healthcare setting. Stroke survivors who experience anxiety may be more likely to engage with the training if it were actively promoted by their doctor or stroke service.

It is encouraging that the majority of participants reported using the CD as recommended and planned to continue using the training. Furthermore, there were low drop-out rates across the study, with only two of twenty-one participants not fully completing the training and follow ups. In addition, adverse effects were reported by only one participant, and they did not persist beyond the time spent listening to the training.

The comments made about the intervention were also largely positive; it was described as "very relaxing"; "easy to do" and "extremely helpful". Any negative comments were largely focused upon practical aspects of the training (such as its length), rather than upon how useful or effective it was.

Limitations

The key limitation of this study is its small sample size. This makes it difficult to draw conclusions about efficacy with certainty. In the present study we find a very large effect size of d = 1.48. The sample was recruited via stroke survivor groups and an advert in a publication for stroke survivors so, anticipating that future samples might be more heterogeneous, and potentially less interested in research than those involved in the present study, we might expect somewhat smaller effects. As an indication, a sample of 70 participants would give a power of 0.9 to detect effects of 0.72 (alpha = 0.05, one-tailed); this falls within the range of effects found in a review of relaxation approaches for anxiety.[5]

Another concern is whether the sample was representative. It seems likely that this group of participants was highly motivated and held positive beliefs about the effectiveness of a self-help approach, given their willingness to volunteer for the study. Due to the screening procedure, all participants also had intact language abilities and minimal cognitive deficits. It is not known how the findings might apply to those who are less willing or able to engage with a self-help relaxation approach, those with aphasia, moderate cognitive deficits or who are less likely to actively seek psychological support for anxiety.

Unfortunately, due to the study design and the need to ask participants about their use of the CD, the researcher was not blinded to group allocation, so there is the possibility that the reliability of results may be compromised. Lastly, issues regarding self-report of practice should be considered. Future research might consider more objective measures of adherence.

Clinical messages

- Autogenic relaxation in a self-help CD format may reduce post-stroke anxiety.
- Self-help relaxation has the potential to be a feasible and acceptable intervention for post-stroke anxiety.
- Further research is required to fully establish the effectiveness of relaxation training in treating anxiety post stroke.

Conflict of interest

The authors declare that there is no conflict of interest.

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