



# Using reflexology to manage stress in the workplace: A preliminary study

Rhian C. Atkins, Philip Harris\*

Centre for Complementary Therapies, Cardiff School of Health Sciences,  
University of Wales Institute Cardiff, Cardiff, Wales CF5 2YB, UK

## KEYWORDS

Stress management;  
Reflexology;  
Workplace

## Summary

**Background:** Work stress is a major occupational problem in the UK. Few studies have examined the role of complementary therapies in reducing stress in the workplace. To help determine the usefulness of reflexology in managing stress a preliminary study was conducted in an occupational setting.

**Aim:** To explore the use of reflexology in managing stress in the workplace.

**Method:** In a single-subjects experimental design, four employees from a single organisation received reflexology treatments. A range of outcome measures, including the GHQ-12 and the MYMOP2, were used to monitor psychological health and well-being, symptoms and quality of life. Measures were taken at baseline, intervention and follow-up.

**Results:** The data suggested some trends towards improvement in perceived health and well-being following reflexology intervention. Improvements varied by participant and across the different measures.

**Conclusion:** This study was limited by the size of the sample and the nature of the design, which cannot demonstrate cause and effect. The trends towards improvement associated with reflexology suggested that further research may be warranted.

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## Introduction

Work-related stress is the biggest occupational health problem in the UK. Over half a million people experience stress at work to a level they believe is making them ill, costing organisations

around £3.7 billion every year. On average, each stress-related absence involves 29 working days lost, totalling 13 million days in 1 year.<sup>1</sup>

Excessive stress, without the opportunity to recover, can cause physical and psychological problems. Acute responses include tension, fatigue, nausea and headache, whereas stress over a period of time exposes the body to risk of infection and the onset of chronic conditions like heart disease, digestive disorders and psychological conditions.<sup>2,3</sup>

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\*Corresponding author. Tel.: +44 29 2041 6894;  
fax: +44 29 2041 6982.

E-mail address: [peharris@uwic.ac.uk](mailto:peharris@uwic.ac.uk) (P. Harris).

Stress can also be related to the prevalence of musculoskeletal disorders, which are the most commonly reported work-related illness, causing long-term absenteeism in the workplace.<sup>4</sup> To avoid loss of income and high litigation costs, many UK businesses are now seeking inexpensive and convenient solutions to reduce stress and prevent the onset of illnesses. In doing so they are more likely to benefit from a healthier and happier workforce, lower sickness absence, better performance and improved service and profits.<sup>1</sup>

A holistic approach to stress management attempts to tackle the underlying causes of stress by addressing the individual's physical, psychological and social factors, rather than treating symptoms alone. With the focus on prevention rather than cure, therapists may advise and support lifestyle and dietary changes to help promote and maintain good health in the long term, thereby maximising the individuals' capacity for self-healing.<sup>5,6</sup>

Reflexology is the systematic application of pressure to reflex points on the foot or, less frequently, the hand.<sup>7</sup> It is widely used in the UK to treat conditions such as back and neck pain, migraine and headaches, chronic fatigue, insomnia, digestive problems and other stress-related disorders.<sup>7-9</sup> Treatments such as reflexology are also being used within some organisations as part of an integrated stress management programme.<sup>5</sup> However, few rigorous studies have been conducted on the efficacy of reflexology and little is known of its effectiveness as a means of managing stress in the workplace.

To date, only one study has been published directly investigating the effect of reflexology on physiological and psychological indicators of stress.<sup>10</sup> Thirty healthy participants underwent reflexology and no treatment control in a cross-over experimental design. Reflexology was found to have reduced state anxiety and cardiovascular activity consistent with stress reduction but there was no significant effect on trait anxiety or the stress-related secretion of cortisol and melatonin. The study excluded the influence of a therapeutic relationship as each participant only received one 60-min reflexology treatment; however, this raises the question of whether a single reflexology treatment is sufficient to bring about the change in trait anxiety or stress-related hormones.

A single-blind experiment examined the effects of reflexology and foot massage on the regulation of blood pressure by measuring baroreceptor reflex sensitivity (BRS) in 24 students.<sup>11</sup> The group receiving reflexology and foot massage showed a reduction in BRS when compared to the control

group but the effect did not achieve statistical significance.

A study using qualitative methods suggested that a sample of women with poor mental health felt less anxious and more relaxed after receiving eight weekly reflexology treatments.<sup>12</sup> However, it cannot be assumed that the reported effects were the direct result of reflexology intervention.

A recent pilot study investigated the use of reflexology in the management of musculoskeletal disorders.<sup>13</sup> Fifteen participants with non-specific lower back pain were randomised to receive either reflexology or foot massage for 40-min once a week for 6 weeks. The results showed that the participants receiving reflexology experienced a consistent reduction in pain throughout the study compared to participants receiving massage, but the difference did not achieve significance. Although the small sample could not provide statistically significant evidence, it presented sufficient data to encourage further investigation.

Other studies suggest reflexology may warrant further investigation as a means of alleviating the sensation of pain,<sup>14</sup> increasing joint mobility and improving sleep by relieving tension and encouraging feelings of well-being.<sup>8,9</sup>

To investigate the benefits of using reflexology at work, a preliminary study was conducted in an occupational setting with employees who reported high levels of stress and stress-related symptoms. The aim was to explore the use of reflexology in managing stress in the workplace using a range of outcome measures.

## Method

### Design

A single-subjects experimental design (SSED) was used with a baseline phase (A<sup>1</sup>), an intervention phase (B) and a follow-up phase (A<sup>2</sup>). This design differs from the case study, in that a baseline series of data are collected before the intervention phase commences; in this way a degree of control is established through the comparison of data taken during baseline and intervention. Typically the design uses small numbers of participants and has been established as a useful practitioner-researcher tool in clinical and educational settings.<sup>15</sup> It has also been used to evaluate the effectiveness of manipulative physiotherapy in a single case study,<sup>16</sup> and to conduct a preliminary investigation of the effects of a yoga-based exercise programme on four participants with chronic poststroke hemiparesis.<sup>17</sup>

**Table 1** List of stress-related symptoms.

- Cold and/or infections
- Headaches or migraines
- Muscular tension
- Repetitive strain injury
- Back, shoulder and/or neck pain
- Sleep disturbances
- Digestive disorders that include heartburn, indigestion, constipation, diarrhoea, IBS
- Irregular heartbeat, palpitations
- Excessive tiredness, fatigue or exhaustion
- Skin irritations or regular flare ups of eczema, psoriasis, or hives
- Reproductive problems
- Asthma attacks or shortness of breath
- Anxiety or nervousness
- Depression

## Participants

A manufacturing company with approximately 600 employees was approached because of its commitment to staff welfare. Permission was obtained from the organisation to conduct the study on their premises. To limit the number of employees taking time out during working hours, a maximum of four individuals volunteered to participate. Ethical approval was gained from the University of Wales Institute Cardiff, written informed consent was obtained from the employer and participants and anonymity and confidentiality were assured.

Inclusion criteria required participants to be over the age of 18, experiencing high levels of stress for at least 6 months (as verified by the company's occupational health department), and suffering from at least one stress-related symptom shown in Table 1. It was agreed that no other complementary therapy would be received during the study, but any prescribed medication would be continued. A risk assessment was conducted to ensure participants were excluded if they recently had surgery, had any current health concerns under investigation or were suffering from a life-threatening illness. The four employees who participated were aged 37 to 58 (mean 44.8); three were female and one male. All were in full time administrative jobs, regularly worked with computers and interacted with people.

## Data collection methods

To identify trends in the participants' symptoms, psychological health and well-being, data were collected using a range of methods.

A semi-structured interview was conducted at the start and end of the study using a structured set of closed questions that are related to factors associated with stress in the workplace; and some open questions allowing for individual comments.

Two standardized questionnaires were used. The General Health Questionnaire (GHQ-12) is a well-validated 12-item, self-administered measure focusing on the psychological components of ill health and well-being. Each of the 12 items asks whether the respondent has experienced a particular symptom or behaviour recently using a four-point scale; higher scores indicate poorer psychological well-being.<sup>18</sup> The GHQ-12 has been used extensively as an outcome measure in studies of occupational stress.<sup>19,20</sup> The Measure Yourself Medical Outcome Profile (MYMOP2)<sup>21</sup> measures the outcomes that the client considers the most important. The client chooses one or two symptoms that bother them most and rates each symptom over the last week on a seven-point scale where 0 is 'As good as it could be' and 6 is 'As bad as it could be'. MYMOP has been frequently used as a patient-centred outcome measure and evidence suggests that it is a sensitive measure of change in perceived symptoms and quality of life.<sup>22,23</sup>

Three data collection methods were designed by the authors specifically for the study. Participants were asked to rate on 10-cm visual analogue scales (VAS), their levels of stress, health, mood, energy, quality of sleep and feelings of relaxation; high scores represented high feelings of well-being. A symptom checklist (SC) was designed to gather information about 14 symptoms that are commonly associated with stress<sup>24</sup> (see Table 1). Participants rated each symptom for severity and frequency using five-point scales (high scores represented high severity and frequency), which were summed to give a total score per week. Participant familiarity with the SC was reduced by changing the order of the symptoms each week. To gain further data about symptoms the participants deemed to be important, a daily diary was designed. Each week individual participants were asked to self-elect one or two symptoms that bothered them most and to comment daily on any changes to these symptoms over the course of the week. Previous studies have found diary techniques to be a useful and reliable source of data.<sup>25</sup>

## Procedure

The study was carried out over 9 weeks. The baseline phase (A<sup>1</sup>) was 3 weeks with measures taken and no treatments given; in the intervention

**Table 2** Schedule of measures taken during each phase of the study.

Week	Phases	Start/end interviews	GHQ-12	MYMOP2	Symptoms Checklist	VAS measures	Daily diary
1	A <sup>1</sup>	✓	✓	✓	✓	✓	
2	A <sup>1</sup>				✓	✓	
3	A <sup>1</sup> /B			✓	✓	✓	✓
4	B				✓	✓	✓
5	B		✓		✓	✓	✓
6	B				✓	✓	✓
7	B			✓	✓	✓	✓
8	A <sup>2</sup>				✓	✓	
9	A <sup>2</sup>	✓	✓	✓	✓	✓	

phase (B) participants received a 60-min reflexology treatment once a week for 5 weeks with measures taken. In the final follow-up phase (A<sup>2</sup>) measures were taken over a 2-week period and no treatments were given.

As shown in Table 2, GHQ-12 measurements were taken during weeks 1, 5 and 9 and MYMOP measures at weeks 1, 3, 7 and 9. Data using the SC and VAS measures were collected weekly for 9 weeks. During the intervention period, measures were completed by participants immediately before the reflexology treatment. Participants were asked to keep a daily diary during the intervention phase only.

All data were collected by the first author. The same author, a qualified reflexologist, also treated all four participants during the intervention phase.

The reflexology treatment was carried out on-site in a private room on a bed with a back adjustment with pillows for support. After an initial foot examination, a traditional reflexology session was carried out in a sequence of massage strokes and gentle pressure to reflexes on both feet. No additional advice about health or lifestyle changes was given.

### Data analysis

Mean scores from the GHQ-12, MYMOP2, SC and VAS were used to identify trends over the baseline, intervention and follow-up phases. The symptoms experienced as most troublesome (worst) by each participant were identified from the SC scores at baseline: any symptom with a total score greater than the mean for all 14 symptoms was considered as the worst experienced.

The interview and diary data were content analysed by categorising similar responses and identifying themes.

### Results

The four participants completed all three phases of the study. Participant 2 missed one treatment and 1 week at follow-up due to work commitments and Participant 3 missed a treatment due to holiday leave; no data were collected for these participants during the missing weeks.

From the initial interviews, it was apparent that all four participants said that they had experienced levels of stress which they believed to be having a direct negative effect on their physical and psychological well-being. When asked what aspects of work increased their stress levels, comments included 'unrealistic timeframes, deadlines, workload and dealing with people'. The participants reported that increased stress levels caused them to feel frustrated and out of control, and led to poor memory and irritability; all of which affected their performance at work. All four stated that they experienced fatigue and sleep problems and three of them experienced musculoskeletal disorders. Only Participant 1 had taken days off work (2 days) as a consequence of these symptoms in the last year. Participant 3 was taking medication and was the only one to have used complementary therapies before.

Figure 1 shows the scores for each participant on the GHQ-12. Participants 1, 3 and 4 reported improved psychological well-being from baseline to intervention. The small improvement shown by Participant 4 returned to baseline at follow-up and Participant 3 showed a similar trend. It was evident that Participant 2 reported deterioration after the initial 2 weeks of reflexology treatments. Two further observations are notable: first, all four participants reported relatively high levels of psychological well-being at all three data collection points (given that the distribution of scores on the GHQ using the Likert scoring ranged from

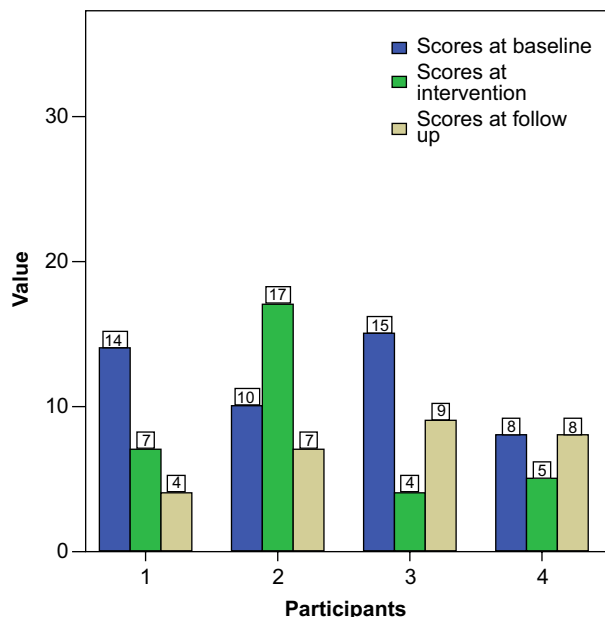


Figure 1 Scores for each participant from the GHQ-12.

0 to 36); second, the participants with the lowest psychological well-being at baseline (Participant 1 and 3) showed the greatest improvements at intervention.

A variation in main symptoms was reported across all four participants in the MYMOP2 at week 1. All participants stated they were not taking medication for their main symptom (i.e. Symptom 1 on the MYMOP2 scale). Participants 1 and 2 had been experiencing their main symptom for 3 months to 1 year, whereas, Participants 3 and 4 had been experiencing their main symptom for 1–5 years. Participants 1, 3 and 4 felt avoiding medication for their problem was ‘very important’ but Participant 2 felt this was ‘not applicable’. The mean scores shown in Figure 2 were calculated using the mean of all nominated scales for each participant at all four data collection points.<sup>21</sup> The first two columns for each participant represent measures taken before the intervention: note missing data for Participant 2 at the start of the intervention. Participants 1, 2 and 3 reported a steady improvement in symptoms that were most bothersome at baseline and this was maintained at follow-up. Scores for Participant 4 increased on the second measure before the intervention and showed some improvement at follow-up.

Figure 3 suggests a downward trend in the severity and frequency of symptoms associated with stress for Participants 1, 3 and 4 from baseline to intervention with a slight increase at follow-up for Participant 3. Participant 2 reported a small increase in SC scores at intervention. Further

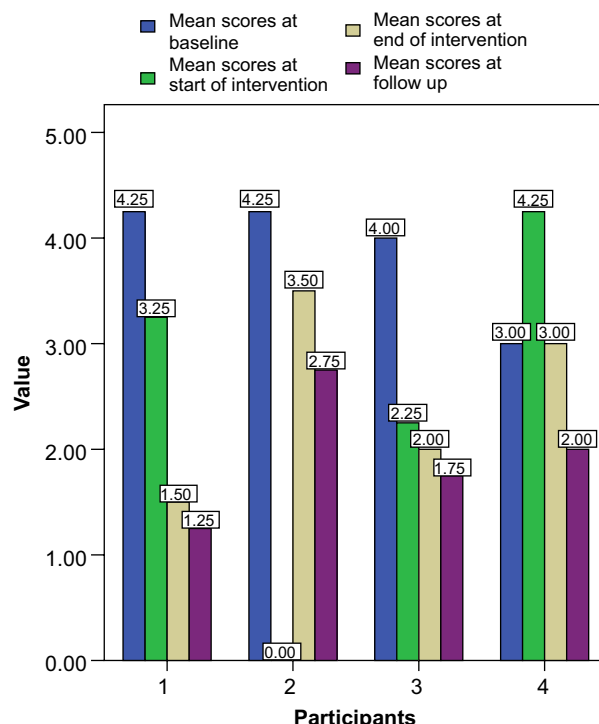


Figure 2 Mean scores for each participant from the MYMOP2.

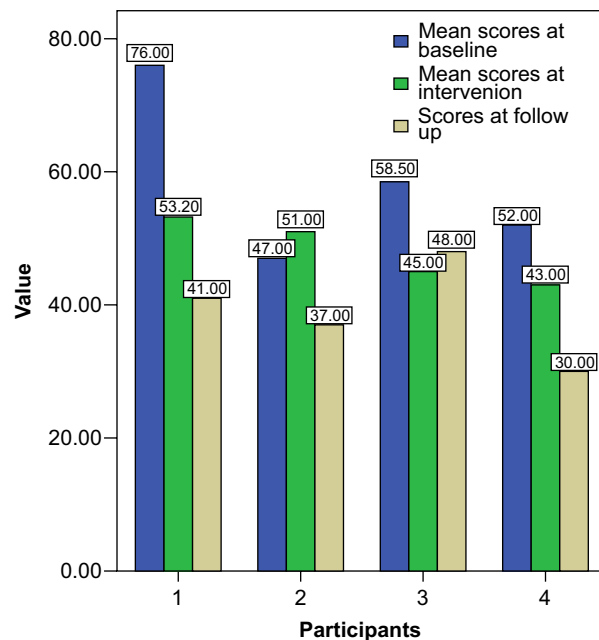


Figure 3 Mean scores from the symptom checklist (SC).

analysis of this data showed the following. Participants 1, 2 and 3 reported the greatest improvement with musculoskeletal problems particularly ‘muscular tension’ and ‘back, shoulder and/or neck pain’. Other symptoms such as ‘sleep disturbances/difficulty getting off to sleep’ improved consistently

for participants 1, 3 and 4 during the study. However, with the exception of one participant (Participant 1), some deterioration was observed in individual scores, particularly during the intervention phase; the most evident were symptoms such as ‘headaches and migraines’ and ‘anxiety/nervousness’.

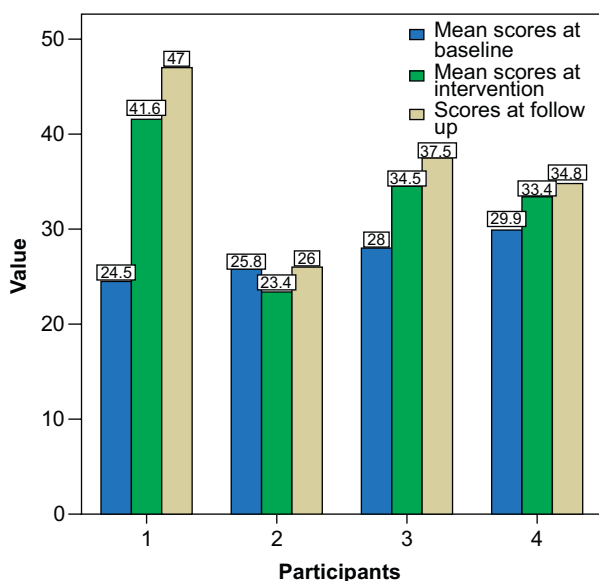
The mean combined scores for the VAS measurements of stress, health, mood, energy, quality of sleep and feelings of relaxation suggest (see Figure 4) that three of the participants reported consistent improvements in well-being over the study period, while Participant 2 reported little change. Further analysis showed that the scores for mood and quality of sleep consistently improved for all participants. Energy levels improved for Participant 1 over the entire period of the study. Participant 2 showed a decline in scores for energy, particularly during the intervention phase. Participants 3 and 4, on the other hand, showed improvements during the intervention phase with scores deteriorating at follow-up. Participants 1 and 3 reported improvements in mean scores for stress and relaxation; Participant 2 showed no improvement in these measures, whereas Participant 4 indicated a persistent increase in stress and decrease in relaxation across the study.

Two main themes emerged from content analysis of the diaries: signs of improvement were noted soon after the reflexology treatment, with symptoms returning later in the week, or symptoms were worsened in the first few days after treatment and improved later in the week. Participants 1 and 3 monitored the same symptoms throughout the

intervention, whereas symptoms indicated by Participants 2 and 4 changed during the course of treatments.

In the final semi-structured interviews, participants were asked if there had been an improvement, a decline or no change in their stress-related symptoms. Three participants (Participants 1, 2 and 4) reported overall improvements in managing stress levels and quality of sleep; two participants (Participants 1 and 3) noted they felt their general health and well-being had improved but the other two reported no change. No participant reported having taken any time off work during the study period.

The participants’ comments about receiving treatments included ‘knowing I was having reflexology and looking forward to it, helped me get through the week... the treatments reminded me how to relax’. All participants agreed that it was important to manage stress levels and three said they would use reflexology in the workplace if it were offered to them. One participant said ‘where we can identify people with stress, it is a good way of helping them’ and another stated that ‘even if it is an hour out of work time, it brought more awareness to my physical need’. Further comments referred to the importance of having a good client–therapist relationship, for example, one participant said ‘I enjoyed it thoroughly. Knowing someone was available to help—to listen without being judgmental, helped me’ and another participant stated that ‘feeling comfortable with the therapist helped me’.



**Figure 4** Mean scores of well-being (VAS) for each participant.

## Discussion

Overall the results from the range of outcome measures used in this study identified stronger trends towards improvement than deterioration in perceived health and well-being following reflexology intervention for the four participant employees in the workplace.

Participant 1 reported consistent improvements across all outcome measures. Data from the GHQ-12 and the MYMOP2 indicated that most of the participants reported improvements in general health, perceived symptoms and quality of life at intervention and at follow-up. The combination of the GHQ-12 and the MYMOP2 with questions relating to psychological and physical health and well-being presented important information, which was supported by findings from the other data collection methods used in this study. The MYMOP2, in particular, was helpful in assessing clinical changes among participants who experienced

different symptoms and is therefore a viable instrument for use in SSEDs.

While all four participants reported some positive effects there was variation between participants and some inconsistencies in the data. In the end of study interview, three participants (Participants 1, 2 and 4) reported improvements in managing their stress levels, whereas data collected using the VAS showed increased stress levels for Participants 2 and 4. It is possible that the participants distinguished between their ability to manage stress levels and their actual stress levels. The VAS data also indicated a trend towards improvement in relaxation for two participants (Participants 1 and 3) over the course of the study, which is consistent with findings from a previous study.<sup>12</sup>

There was a marked contrast between stress and relaxation levels, as indicated on the VAS, for two of the participants. Participant 1 showed the greatest decrease in stress and increases in relaxation which persisted at follow-up, whereas Participant 4 showed increased stress and decreased relaxation levels during the intervention, which improved at follow-up. When examining the effects of a yoga-based exercise programme for people with chronic poststroke hemiparesis,<sup>17</sup> the authors suggested that differences in the outcomes demonstrated by the four participants in the study might be explained by the differing characteristics of the participants: the participant who demonstrated most improvements was the most adherent to the yoga programme. However, it is difficult to explain the differences in stress levels as reported in the current study in this way as Participants 1 and 4 both adhered to the reflexology treatments.

It was also notable that three of the participants (Participants 1, 2 and 3) reported musculoskeletal problems in the interviews at the start of the study and rated these symptoms as the worst experienced in the SC at baseline. When receiving reflexology, they all showed improvements in these symptoms, which coincided with recent research findings.<sup>13</sup> On the other hand, anxiety has been shown to reduce in previous studies,<sup>10,12</sup> while the SC data showed that it increased markedly for Participant 2 in the current study.

The following participants missed a treatment during the intervention phase which may have affected the outcome. Participant 3 showed the most improvement in scores in the GHQ-12, whereas Participant 2 showed a deterioration in scores during the same period. Whilst it was noted that Participant 3 was on holiday and was the only participant taking medication when interviewed at

the start of the study, Participant 2 missed a treatment and a further session due to work commitments. This highlights the unpredictability of people who experience stress in the workplace due to demands and busy schedules. It may also suggest a lack of collaboration towards the study or commitment to improving health.

The SSED is a useful tool for exploring trends, by collecting baseline data before the intervention begins each subject acts as their own control.<sup>15</sup> However, there are frequently pragmatic limits imposed on the length of the baseline period, as was the case in this study, which limits the reliability of the control. The therapist acting as researcher also has its own inherent limitations, in particular, there is an increased risk of biased reporting by the participants who may wish to please the therapist, although it should be noted that participants reported negative as well as positive trends.

The package of measures used in this preliminary study explored a range of outcomes and the design allowed data to be examined across baseline and intervention phases, and at follow-up. However, the greatest limitation of the SSED is that it cannot establish a causal relationship. Any of the improvements reported here may have been due to factors other than the reflexology intervention, for example, therapeutic touch, having time away from work, receiving special attention or simply experiencing something pleasant. Alternatively the participants may have been motivated towards a positive outcome if they thought it could lead to reflexology treatments being introduced into the workplace. Furthermore, the current study involved a series of reflexology treatments and the impact of the therapeutic relationship cannot be excluded. Indeed two of the participants reported that the relationship with the therapist had been an important part of the process.

Research into the effectiveness of a therapy usually progresses in a series of steps. Arguably, although the results from this preliminary study are limited, they highlight key areas of interest for further investigation. Subsequent studies may build on the issues raised in this research, using similar data collection methods, but with larger samples. The use of an uncontrolled trial could be another step in establishing whether reflexology, as a means of reducing stress in the workplace, is worth investigating further. It has been argued<sup>26</sup> that uncontrolled trials have a number of important functions in the early stages of research: they can be used to establish if there is a clinical effect worth investigating, identify the most suitable participants, as well as the most appropriate

outcome measures, and can be conducted by practitioners in the course of their normal work.

### Publishing student work: Editorial note

The above paper by Atkins & Harris forms part of a student undergraduate degree submission. We feel it is important to encourage students to consider writing for publication. Too often undergraduate and post graduate studies are relegated to dusty shelves (or hard drives) never to be seen again. This is a pity. Even though studies may not be perfect or comprise of small scale work, the process of writing for publication is an important career step. It may also encourage others to realise that publication is not the sole domain of academics but of people who have something valuable to impart to others and which may bring a new dimension or insight into an old problem.

So, if you are about to graduate, submit your MA, MSc or PhD in integrative medicine, your work may well contain new information worth sharing with others. Denise Rankin-Box

### Conflict of interest statement

None declared.

### Acknowledgements

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