

Self-administered acupressure for insomnia: abridged secondary publication

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KEY MESSAGES

1. Self-administered acupressure results in significantly greater reduction in symptom severity of insomnia at weeks 4 and 8, compared with sleep hygiene education.
2. Self-administered acupressure results in greater improvement in anxiety, depression, and health-related quality of life at week 8, compared with sleep hygiene education.
3. A short training course (two 2-hour sessions) of self-administered acupressure is an acceptable first-step intervention for people with insomnia.

Hong Kong Med J 2023;29(Suppl 2):S35-8

HMRf project number: 15161181

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Introduction

Insomnia is a prevalent sleep disorder. Early diagnosis and treatment of insomnia are crucial, because the condition may lead to anxiety and depressive disorders if left untreated. Pharmacotherapies such as benzodiazepines and non-benzodiazepine hypnotics are effective but are associated with abuse, dependence, and uncertain efficacy with long-term use. Psychological and behavioural therapies are also effective but remain underused in primary care possibly owing to the need for advanced training for effective implementation.

Acupressure is a non-invasive variant of acupuncture and can be self-administered after proper training. It has positive effects on improving sleep quality on cancer patients, menopausal women, and hypertensive patients.¹ It also has greater effects on older people with poor sleep quality than sleep hygiene education has.² However, the effectiveness of self-administered acupressure against insomnia remains unknown, owing to the lack of the use of standardised sleep assessments (sleep diary and actigraphy) and unclear diagnostic method of insomnia.¹ We therefore conducted a randomised controlled trial to determine the effects of self-administered acupressure for insomnia in general adults using standard sleep outcome measures.

Methods

This study was conducted from October 2018 to September 2020. Participants were randomly

assigned to receive two 2-hour sessions, 1 week apart, of either self-administered acupressure or sleep hygiene education in a 1:1 ratio. Participants were instructed to perform self-administered acupressure or sleep hygiene every night and record their practice in a logbook. Participants were assessed at baseline, week 4, and week 8 by a research assistant blind to the group allocation. The primary outcome was the severity of insomnia symptoms and related daytime impairment measured by the 7-item self-rated Insomnia Severity Index (ISI). Other measures included subjective sleep parameters by a standardised 7-day sleep diary, objective sleep parameters collected by 7-day wrist actigraphy, mood symptoms by the Hospital Anxiety and Depression Scale (HADS), health-related quality of life by Short-Form Six-Dimension (SF-6D), and credibility and acceptability of treatment by the Credibility of Treatment Rating Scale.

Results

A total of 200 participants were equally randomised to self-administered acupressure (n=100) or sleep hygiene education (n=100) [Table 1]. The two groups were comparable in terms of participant characteristics, except that the sleep hygiene education group had higher score in ISI (P=0.009) and HADS depression subscale (P=0.04) and lower score in SF-6D (P=0.02).

Both groups had 97 participants completed the first and second lessons. All participants in the

TABLE 1. Clinical characteristics of participants*

Variable	All (n=200)	Self-administered acupressure (n=100)	Sleep hygiene education (n=100)
Age, y	48.0±12.8	47.6±12.7	48.5±12.9
Female	150 (75.0)	74 (74.0)	76 (76.0)
Body mass index, kg/m ²	22.3±3.5	22.4±3.5	22.3±3.6
Marital status			
Single	59 (29.5)	31 (31.0)	28 (28.0)
Cohabiting/married	123 (61.5)	60 (60.0)	63 (63.0)
Widowed/divorced	18 (9.0)	9 (9.0)	9 (9.0)
Education level			
Secondary education or below	82 (41.0)	35 (35.0)	47 (47.0)
Tertiary education	118 (59.0)	65 (65.0)	53 (53.0)
Occupation			
Employed	102 (51.0)	54 (54.0)	48 (48.0)
Economically inactive	80 (40.0)	34 (34.0)	46 (46.0)
Unemployed	4 (2.0)	4 (4.0)	0 (0.0)
Self-employed	14 (7.0)	8 (8.0)	6 (6.0)
Insomnia duration, y	6.1±7.7	5.4±7.1	6.8±8.1
With chronic disease	41 (20.5)	22 (22.0)	19 (19.0)
History of psychiatric comorbidities	12 (6.0)	4 (4.0)	8 (8.0)

* Data are presented as mean ± standard deviation or No. (%) of participants

self-administered acupressure group passed the fidelity check of the acupressure techniques at the end of training. 92.3% and 88.8% participants in self-administered acupressure group practiced at least 5 days per week during weeks 1 to 4 and during weeks 5 to 8, respectively.

Compared with the sleep hygiene education group, the self-administered acupressure group showed better improvement in ISI score with moderate effect size at weeks 4 and 8 (Cohen's $d=0.51$ and 0.67 , respectively, all $P<0.001$, Table 2), higher proportion of participants with ISI score <10 at week 8 (41.9% vs 11.6%, $P<0.001$), higher sleep-diary-derived total sleep time and sleep efficiency at week 4 (Cohen's $d=0.32$ and 0.30 , respectively, all $P=0.03$) but not at week 8, greater improvement in HADS anxiety score (Cohen's $d=0.35$, $P=0.02$) and depression score (Cohen's $d=0.28$, $P=0.049$) and SF-6D (Cohen's $d=0.32$, $P=0.02$) at week 8 but not at week 4. However, no significant difference was found between groups in objective sleep parameters by wrist actigraphy (sleep onset latency, wake time after sleep onset, total sleep time, and sleep efficiency) at week 4 or 8.

Discussion

Self-administered acupressure was more effective than sleep hygiene education in improving insomnia.

Participants in the self-administered acupressure group showed longer sleep-diary-derived total sleep time and sleep efficiency at week 4 as well as greater improvement in depression, anxiety, and quality of life at week 8. However, the magnitude of the effect did not reach clinical significance. Self-administered acupressure achieved a moderate effect size in improvement of ISI score (Cohen's $d=0.51-0.67$). In contrast, one study reported a large effect size (Cohen's $d=1.54$) on improving the sleep questionnaire score among older adults with poor sleep.² Such difference may be attributed to the longer treatment duration (12 months), higher treatment intensity (30 minutes, twice per day), and additional home visits of the study.² Further studies are warranted to determine the optimal dose for self-administered acupressure.

The improvements in total sleep time and sleep efficiency by subjective sleep diary were not confirmed by objective actigraphy. People with insomnia commonly have subjective-objective sleep discrepancy, which is the time difference between self-reported and objectively measured sleep features. Actigraphy is less reliable for differentiating between quiet wakefulness and sleep and tends to overestimate sleep in people with insomnia by including the time lying and waiting to fall asleep and after waking from sleep. Thus, the use of both subjective and objective measurements is

TABLE 2. Insomnia Severity Index and subjective and objective sleep parameters of the two groups at baseline and week 4 and week 8

Outcomes	Self-administered acupressure (n=100)*		Sleep hygiene education (n=100)*		P value	Effect size, Cohen's <i>d</i> (95% confidence interval)
		Change from baseline		Change from baseline		
Insomnia Severity Index						
Baseline	16.00 (0.37)	-	17.38 (0.45)	-		
Week 4	11.32 (0.37)	-4.68 (0.34)	14.59 (0.45)	-2.79 (0.40)	<0.001	0.51 (0.22 to 0.79)
Week 8	10.41 (0.38)	-5.59 (0.41)	14.68 (0.46)	-2.70 (0.46)	<0.001	0.67 (0.38 to 0.95)
Sleep diary						
Sleep onset latency, min						
Baseline	44.06 (3.19)	-	48.49 (3.69)	-		
Week 4	31.84 (3.31)	-12.23 (3.20)	39.54 (3.78)	-8.95 (3.24)	0.47	0.10 (-0.18 to 0.38)
Week 8	34.05 (3.34)	-10.01 (3.11)	35.62 (3.83)	-12.87 (3.52)	0.55	-0.09 (-0.36 to 0.19)
Wake after sleep onset, min						
Baseline	42.84 (2.74)	-	45.43 (3.85)	-		
Week 4	29.91 (2.84)	-12.93 (2.76)	34.36 (3.93)	-11.07 (3.00)	0.67	0.06 (-0.21 to 0.34)
Week 8	22.56 (2.90)	-20.28 (3.29)	33.78 (3.98)	-11.65 (3.39)	0.08	0.26 (-0.02 to 0.54)
Total sleep time, min						
Baseline	332.41 (6.39)	-	327.19 (7.40)	-		
Week 4	366.43 (6.57)	34.02 (5.28)	344.22 (7.55)	17.03 (5.41)	0.03	0.32 (0.04 to 0.60)
Week 8	369.60 (6.65)	37.19 (5.68)	353.12 (7.13)	25.93 (5.63)	0.16	0.20 (-0.08 to 0.48)
Sleep efficiency, %						
Baseline	73.32 (1.26)	-	71.66 (1.57)	-		
Week 4	79.93 (1.29)	6.61 (1.11)	75.14 (1.60)	3.48 (0.99)	0.03	0.30 (0.02 to 0.58)
Week 8	80.27 (1.31)	6.95 (1.11)	77.32 (1.61)	5.67 (1.16)	0.42	0.11 (-0.16 to 0.39)
Actigraphy						
Sleep onset latency, min						
Baseline	20.79 (1.64)	-	19.66 (1.51)	-		
Week 4	20.08 (1.79)	-0.71 (1.80)	18.03 (1.62)	-1.63 (1.45)	0.68	-0.06 (-0.33 to 0.22)
Week 8	18.37 (1.84)	-2.42 (1.90)	19.66 (1.51)	-0.69 (1.46)	0.50	0.10 (-0.18 to 0.38)
Wake after sleep onset, min						
Baseline	32.96 (2.02)	-	35.10 (2.56)	-		
Week 4	30.72 (2.20)	-2.24 (2.13)	34.34 (2.67)	0.76 (1.87)	0.59	0.07 (-0.20 to 0.35)
Week 8	31.64 (2.23)	-1.32 (2.09)	38.25 (2.78)	3.15 (2.26)	0.15	0.21 (-0.07 to 0.48)
Total sleep time, min						
Baseline	394.69 (5.22)	-	395.25 (5.35)	-		
Week 4	401.19 (5.52)	6.50 (4.26)	397.69 (5.72)	2.44 (5.05)	0.55	0.09 (-0.19 to 0.36)
Week 8	398.00 (5.60)	3.31 (4.37)	391.69 (6.00)	-3.56 (5.76)	0.34	0.13 (-0.14 to 0.41)
Sleep efficiency, %						
Baseline	85.45 (0.68)	-	85.18 (0.72)	-		
Week 4	86.30 (0.73)	0.84 (0.61)	85.95 (0.76)	0.77 (0.59)	0.93	0.01 (-0.27 to 0.29)
Week 8	86.56 (0.75)	1.11 (0.68)	84.89 (0.79)	-0.29 (0.71)	0.16	0.20 (-0.08 to 0.48)

* Data are presented as mean (standard error), unless otherwise specified

recommended in sleep research. Subjective measure remains the priority, as insomnia is a subjective complaint.

The effects of acupressure on sleep may involve the activation of the parasympathetic nervous system, increase in autonomous responses, and reduction of psychological stress.¹ A functional magnetic resonance imaging study of healthy subjects reported that needling at CV12 could modulate the limbic-prefrontal functional network, which is overlapped with the functional circuits associated with emotional and cognitive regulation.⁴ Acupuncture needling at Neiguan (PC6) can reduce heart rate and systolic blood pressure, suggesting its sympatho-inhibitory effect.⁵ Whether acupressure on these acupoints would produce the same effects as acupuncture warrants further investigation. Sleep hygiene education is commonly used to control the non-specific effect of practitioner-patient interactions in the randomised controlled trials of self-help and psychological interventions for insomnia.

The present study has limitations. Polysomnographic screening was not used although patients with other sleep disorders such as sleep apnoea and narcolepsy were excluded. In addition, participants were predominantly female (75%) and relatively well educated (>50% having tertiary education). This may limit the generalisability of the findings. The sleep hygiene education group had a significantly higher ISI score (more severe insomnia) at baseline, which may inflate the effect size. Although sleep hygiene education may be used to control the practitioner-patient interactions and contact time, specific components such as precise acupoint stimulation were not examined. Further research may include a sham control.

Conclusion

Self-administered acupressure taught in a short training course is effective to improve sleep and related daytime impairment and mood problems in people with insomnia in short term (up to week 8). Self-administered acupressure is easy to learn, non-

invasive, and less time-intensive; it is an acceptable first-step care for insomnia.

Funding

This study was supported by the Health and Medical Research Fund, Health Bureau, Hong Kong SAR Government (#15161181). The full report is available from the Health and Medical Research Fund website (<https://rfs1.fhb.gov.hk/index.html>).

Disclosure

The results of this research have been previously published in:

1. Yeung WF, Yu BY, Chung KE, et al. Self-administered acupressure for insomnia disorder: a randomized controlled trial. *Phytomedicine* 2022;99:153993.

Acknowledgements

We thank Dr Lau Chi-ling, Dr Lin Wai-ling, and Mr Wong Siu-kit for delivering the self-administered training. We thank Ms Chan Ying-tung and Fong Ka-na for delivering sleep hygiene education. We thank all participants for their contributions.

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