



Auricular Acupuncture (AA) for Work Related Illness (WRI); Musculoskeletal Disorders (MSD) and Stress, Anxiety and Depression (SAD)

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Abstract

Work related illness (WRI) is physical or mental illness caused by or aggravated by work. WRI affects individuals, their families, employers, the health system, the economy and the community. The two largest categories of WRI are musculoskeletal disorders (MSD) and stress, anxiety and depression (SAD). Health Service Executive (HSE) statistics indicate over a million workers are injured or made ill by their workplace in the United Kingdom each year. In 2016/17 the total cost of workplace self-reported injuries and ill health was £15 billion with ill health being the biggest proportion of total costs at 65% (£9.7 billion) and work place injury resulting in around 35% (£5.2 billion). The Complementary and Alternative Medicine (CAM) treatment modality of Auricular Acupuncture (AA) has been used for over 2500 years, to treat illness and provides a cost effective treatment modality for WRI including MSD and SAD.

Keywords: Auricular Acupuncture (AA); Musculoskeletal Disorders (MSD); Stress, Anxiety and Depression (SAD); Work Related Illness (WRI); Complementary and Alternative Medicine (CAM)

Introduction

WRI is physical or mental illness caused by or aggravated by work. WRI affects individuals, their families, employers, the health system, the economy and the community [1]. The Health Service Executive (HSE) statistics indicate over a million workers are injured or made ill by their workplace in the United Kingdom each year. In 2016/17 the total cost of workplace self-reported injuries and ill health was £15 billion pounds sterling with ill health being the biggest proportion of total costs at 65% (£9.7 billion) and workplace injury resulting in around 35% (£5.2 billion) [2]. The two largest categories of self reported WRI are musculoskeletal disorders (MSD) and stress, anxiety and depression (SAD) [1, 3, 4].

Incidence in Ireland

In 2013, 55,000 workers suffered from a WRI with over 790,000 workdays lost. Between 2002-2013, MSD and SAD accounted for

68% of all WRI. In the EU28 MSD and SAD accounted for 75% of WRI.

MSD	SAD
50 per cent % of all WRI	18 per cent % of all WRI

Table 1: Incidence of MSD and SAD in Irish workplaces [5].

Work Related Ill Health 2017/18 UK [6]

- 1.4 million workers suffering from WRI (new or long-standing).
- 541,000 workers suffering from a new case of WRI.
- 26.8 million working days lost due to WRI .
- 13,000 deaths each year estimated to be linked to past chemical/dust exposure at work.

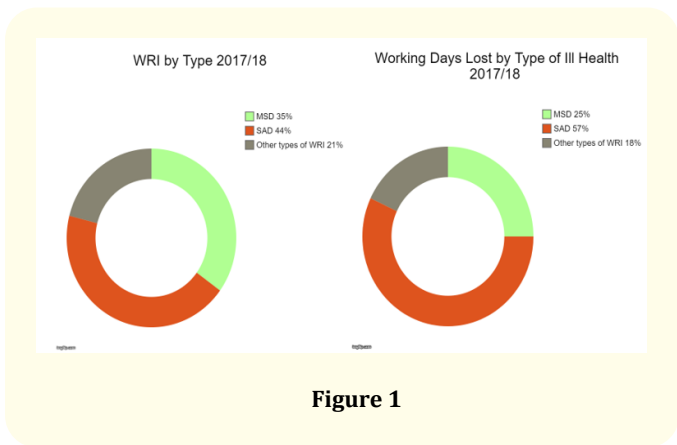


Figure 1

New and long-standing cases of WRI by type and working days lost by type of ill health 2017/18 [7]

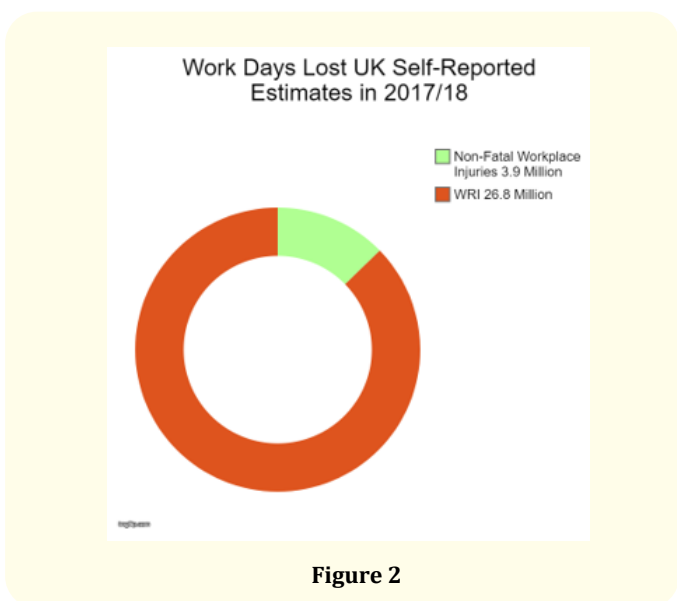


Figure 2

Work days lost UK self-reported estimates in 2017/18

30.7 million working days are lost due to work-related ill health and non-fatal workplace injuries with SAD and MSD accounting for the majority of days lost due to WRI, 15.4 million and 6.6 million respectively. On average, each person took around 16.5 days off work. This can be broken down as follows;

- 7.1 days for injuries.
- 19.8 days for ill health cases.
- 25.8 days for stress, anxiety or depression.
- 14.0 days for musculoskeletal disorders [8].

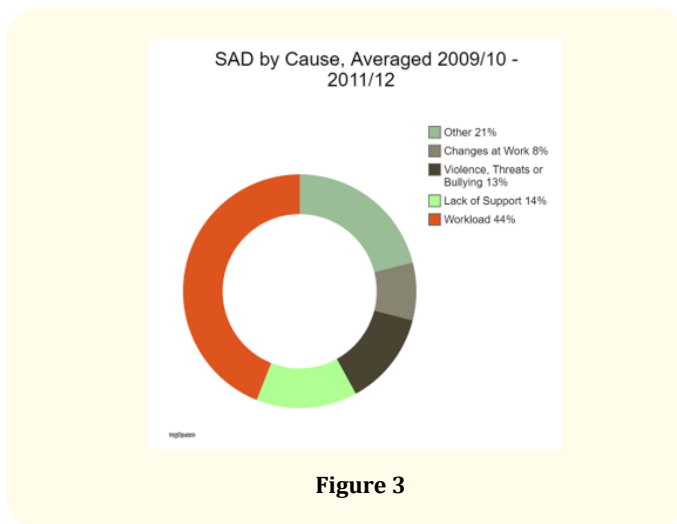


Figure 3

SAD by cause averaged 2009/10 - 2011/12 [6]

- 595,000 workers suffering from work related SAD (new or long-standing) in 2017/18.
- 15.4 million working days lost due to work related SAD in 2017/18.

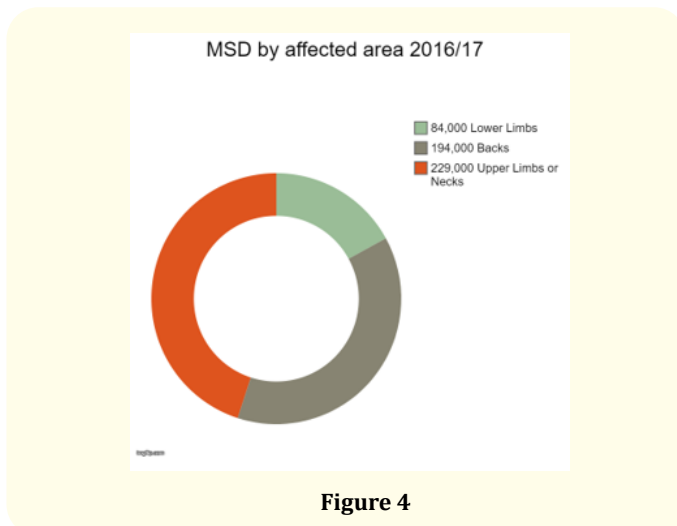


Figure 4

MSD by affected area 2016/17 [6]

- 507,000 workers suffering from work-related MSD (new or long-standing) 2016/17.
- 8.9 million working days lost due to work-related MSD in 2016/17.

Costs in UK 2016/17 (no cost evaluation exists in Ireland)

- £ 15.0 billion annual costs of work related injury and new cases of ill health (excluding long latency illness such as cancer).
- £ 9.7 billion annual costs of new cases of work-related ill health (excluding long latency illness such as cancer).
- £ 5.2 billion annual costs of workplace injury [6].

MSD	SAD
1995/96 UK annual cost estimated at £5.7 billion (equivalent to £10 billion in 2016)	Estimated annual cost ranged between £7 - £13 billion.

Table 2: Financial Cost work related MSD and SAD [4].

WRI in the corporate sector?

No figures exist for the corporate sector. To consider a total figure for a corporate health, combining figures from information and communication, professional scientific and technical activities, administrative and support service activities and financial and insurance activities would in total bring a corporate figure to 10060 which is high and may be statistically significantly higher than other industry.

Work related Ill Health Rate (per 100,000)	Industry Section	Workplace Injury Rates (per 100,000)
4740	Agriculture, forestry and fishing	3690
4500	Human health/social work	1730
4310	Public admin/defence	2190
4260	Utility supply	
3840	Education	1630
3570	Construction	2620
3430	Other service activities	900
3180	Transport/storage	2200
3140	Water supply/waste management	2560
2940	Real estate activities	
2930	Financial insurance activities	
2780	Arts/entertainment/recreation	1880
2670	Manufacturing	2180
2630	Administrative and support service activities	1420
2450	Wholesale/retail trade	2200
2300	Professional scientific and technical activities	860
2200	Information and communication	480
2180	Accommodation/food services	2320
	Mining and quarrying	
3180	All industries	1780
Statistically significantly higher	Statistically significantly lower	No statistical significant difference

Table 3: WRI by industry [6].

Psychosocial risk factors for WRI

As the Whitehall study highlighted, poverty is not the only cause of workplace illness [9]. Psychosocial risks factors include excessive workload, job uncertainty, inflexible, irregular, unpredictable, antisocial work hours, poor work relationships, inability to participate in decision making, an unclear role, difficulty communicating, inability to progress up the career ladder and poor work-life balance [10].

Complementary and alternative medicine (CAM) in Ireland

In 2002, 27% of people used a form of CAM [11]. A conference for GPs in Ireland entitled, “Emerging medicine strategies for integrating orthodox and complementary health care”, reflected an awareness of the increasing popularity of CAM [12]. As health promoters, CAM practitioners can be an additional health resource to address the global burden of chronic disease [13]. EUCAM and the National Working Group on the Regulation of Complementary Therapists in Ireland [14] are looking at the contribution of CAM to sustainable healthcare. The World Health Assembly has urged Member States to integrate CAM within national healthcare systems [15]. Using CAM in the workplace can help satisfy the requirements of the Luxembourg Declaration on Workplace Health Promotion [16].

The preventative medicine network acknowledges that CAM is involved in primary, secondary and tertiary prevention of disease and is synergistic with health promotion [17]. Level 8 (EQF/AQF NFQ/Level 6 Ofqual science degrees holders in CAM prevent disease, encourage screening and manage long term chronic disease. It is also acknowledged that public health promoters aiming to empower individuals and encourage community action support CAM involvement [18]. The EUCAM and the National Working Group on the Regulation of Complementary Therapists in Ireland [19] are looking at the contribution of CAM to a sustainable healthcare system for its role in health promotion. The World Health Assembly has urged Member States to integrate CAM within national healthcare systems [14]. Auricular Acupuncture (AA) is a modality of CAM that has been employed for over 2500 years, to treat illness [20]. A randomised controlled trial (RCT) looking at CAM in the treatment of chronic pain and insomnia in military personnel reported AA as being the most popular CAM treatment modality and concluded that is a cost effective treatment for pain and insomnia and that AA may provide a part solution towards the opioid crisis in the US [21].

Pros of auricular acupuncture (AA)

AA can be offered in a community setting

Community acupuncture offers health work in a community setting that is sociable and empowering [22]. Similarly to community acupuncture, AA is given in the informal setting of the office lounge,

either on yoga mats or recliner lounges and is described as a socio-behavioural wellness model [23].

AA is cost effective and practical

The main barrier to the utilisation of CAM is seen as cost, however when used in a community setting and fees are charged on a sliding scale service according to ability to pay, community acupuncture becomes cost effective it has been found that low-income communities will use CAM [24]. Community acupuncture has been shown to offer substantial savings even as an alternative to knee surgery in patients with osteoarthritis of the knee who would otherwise have been referred to an orthopaedic surgeon [25]. AA as a microsystem technique involving the insertion of fine needles into predetermined points on the external ear only has even greater cost effectiveness and has minimal side effects [26]. Having minimal side effects, AA satisfies calls made by Whitelaw, *et al.* for a realistic and pragmatic settings based approach that moves away from being overly reliant on individualistic methods to promote health [27] and being offered in a community setting, can also help address the psychosocial risk factors for WRI.

AA reduces inflammation, is analgesic and anxiolytic

The use of CAM to alleviate WRI pro-actively promotes health by supporting the body's homeostatic mechanisms [19]. Acupuncture in general, increases the activity of the endogenous opioid peptides enkephalin, beta-endorphin, endomorphin and dynorphin [28], monoamines neurotransmitters serotonin, noradrenalin, dopamine, acetylcholine (Ach), inhibitory amino acids such as γ -aminobutyric acid (GABA), glycine, taurine, and lactamase whilst also attenuating noradrenalin and excitatory amino acids including glutamate and aspartic acid activity [29,30]. In addition acupuncture reduces inflammatory cytokines, tumour necrosis factor (TNF- α), Interleukin (IL) IL-1, IL-6 and C-reactive protein (CRP) [31]. One study specifically on AA, found AA reduces inflammatory mediators IL-1 β , IL-2, IL-6 and increases in IL-4. IL-4 promotes activated B-cell and T-cell proliferation and regulates humoral and adaptive immunity [32].

AA for SAD

A RCT has shown that true ear acupuncture was more effective than placebo to reduce stress in student nurses [33]. According to a State-Trait Anxiety Inventory (STAI) AA can reduce stress, anxiety and pain in HCWs and may improve work engagement [34-36].

AA for MSD

AA is good for any type of pain, in particular post operative pain [37]. A systematic review and meta-analysis reported numerous RCTs showing that acupuncture is effective for pain relief [38]. AA is effective in alleviating lower back pain [39]. A recent systematic review and meta-analysis investigating RCTs on the action of AA for chronic back pain in adults concluded AA is a promising method to treat chronic back pain in adults [40]. AA has been shown to relieve muscle and joint pain in temporomandibular joint disorder (TJM) [41].

What to expect

AA is usually based on National Acupuncture Detoxification Association (NADA) protocol. NADA is a five-point ear acupuncture protocol typically used to treat drug and alcohol withdrawal; they are proven to relieve anxiety and pain of withdrawal [42]. Additional points are often chosen according to the diagnoses Pattern of Disharmony in Traditional Chinese Medicine. The NADA protocol consists of the insertion of 5 small, fine, sterile stainless steel needles under the surface of the skin on specific sites in the outer ear and left in for 20 minutes. Treatment takes half an hour in total.

Short term evaluation

Routine observations including heart rate (HR), blood pressure (BP), and respiratory rate (RR), pain score as indicated by a Visual Analogue Scale (VAS) and anxiety score as indicated by the State-Trait Anxiety Inventory (STAI) can be taken pre and post treatment. Evaluation can also incorporate a talking circle which in itself has been shown to help deal with work related stress [43]. The health circle aims to decrease harm by discussing and finding solutions to the psychosocial and physical causes of MSD and SAD and increasing the capacity of workers by providing emotional support. The health circle can also facilitate health surveillance reports and employee surveys [44].

Conclusion

AA as a CAM treatment modality has been shown to be both a highly effective and cost effective method to treat WRI including MSD and SAD. Not only is AA a cost effective treatment for WRI, AA may provide a part solution towards the global opioid crisis. In light of the current global crisis of overspending in the health care system, the cost effectiveness of AA can no longer be overlooked. It must however be administered by degree qualified acupuncturists with a firm understanding in both health science and Traditional

Chinese Medicine. For purpose of a corporate role out, an RTC toevaluate the efficacy of true AA (ear needles on actual points) and placebo AA (non stimulated press seeds on non points) also using (HR, BP, RR, VAS, STAI) along with key performance indicators (KPI) such as absenteeism and overall labour effectiveness (OLE) in the workplace as a measure of effectiveness is needed [45].

Abbreviations

Acetylcholine (Ach), Auricular Acupuncture (AA) Blood pressure (BP), Complementary and Alternative Medicine (CAM), C-reactive protein (CRP), γ -aminobutyric acid (GABA), Health Service Executive (HSE), Heart rate (HR), Interleukin (IL) IL-1, IL-6 and Key performance indicators (KPI), Musculoskeletal disorders (MSD), National Acupuncture Detoxification Association (NADA), Overall labour effectiveness (OLE), Respiratory rate (RR), Randomised controlled trial (RCT), State-Trait Anxiety Inventory (STAI), Stress, anxiety and depression (SAD), Work Related Illness (WRI), Visual Analogue Scale (VAS)

Declarations

- Ethics approval and consent to participate Not applicable
- Consent for publication Not applicable
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- Authors' contributions Carina Harkin wrote read and approved the final manuscript.
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- Availability of data and materials Not applicable

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