



Return on Investment: Prevention in mental health

e-Health workplace interventions for the prevention of depression

Background

Mental illnesses are among the top 10 health conditions incurring health related costs to employers (1-3). Depression is ranked as the second most expensive mental illness affecting workplaces, with costs occurring due to work impairment, disability and absences from work (4-7). In Australia, the 2007 societal cost of lifetime depression in the workforce was estimated at \$12.6 billion over one year, and \$213.5 billion over a lifetime of the Australian population. The estimated impact of mild depression in Australia is a decrease of 3.9% in labour productivity, rising to 9.2% for severe depression (8). The costs associated with depression in the workplace were largely attributable to absence from work and job turnover, as opposed to healthcare costs (5-6). This economic burden highlights the importance of mental health prevention and promotion in the workplace as emphasised in a 2018 report published by Mental Health Australia and KPMG (9).

There has recently been substantial interest in electronic technology assisted mental health interventions, otherwise known as e-Health interventions (10-12). e-Health interventions can improve the distribution and uptake of effective psychological interventions, especially for the working population who tend not to be frequent treatment seekers for mental illnesses, with only 15% reporting that they sought help in the preceding month (13). The reason for this infrequent use may include stigma and embarrassment, poor mental health literacy, and a preference for self-reliance (14). It is argued that e-Health interventions have advantages compared to face to face interventions because of: a) their ability to be accessed at all times; b) potential for anonymity for the user; c) reduced costs (in terms of intervention delivery and facilitation of access i.e. they can use existing infrastructure); d) treatment fidelity (the correct implementation of the intervention as it was designed and tested); and e) the ability to work with a greater number of participants than in face to face settings (10, 11, 15). An example of an Australian e-Health intervention that has been evaluated in the literature is 'MoodGYM' (<https://moodgym.com.au/>). MoodGYM is provided freely to Australians, with financial support from the Australian Government.

Intervention modelled

The choice of intervention in the current study is a guided psychological electronic Stress Management Intervention (eSMI) delivered through either the internet or preloaded on a computer. This is a targeted intervention offered to employees who, through screening, are found to be at risk of developing a mental illness (i.e. employees who may have elevated levels of stress, insomnia, anxiety or other relevant symptoms). The intervention has been trialled in large businesses of 200 plus employees and offered to employees with fixed term or permanent contracts.

The various steps comprising the intervention on which the modelling is based are illustrated in Figure 1. Generally, people find out about the intervention through internal advertising from their employer (e.g. digital pamphlets/posters/email). Those who are interested in participating complete an online screening survey to identify if they have any symptoms that indicate a risk of developing a mental illness. Those who are at risk then receive a telephone call from a health professional (usually a registered nurse or a psychologist) and are more comprehensively screened to rule out a diagnosis of depression. Those whose symptoms suggest that they are at risk but not yet at the point of being diagnosed with depression, will be offered the eSMI.

The eSMI for employees is designed as a guided self-help program. In brief, most of the eSMIs that have been evaluated are interactive internet programs using cognitive behavioural therapy (CBT) and/or problem solving therapy principles. eSMIs are delivered to individuals via their computers/smart devices using the internet and comprise three to six consecutive sessions (45 minutes to 1 hour per session).

With the guided version, participants receive personalised written feedback (via app or email) from an instructor within two to three working days (16-18). Instructors are usually psychologists trained in the intervention who follow feedback guidelines from a standardised manual (16-18). It is unclear from the existing studies whether employees complete the sessions in their own time or during work time.

The primary outcome of this evaluation is the return on investment (ROI) ratio. This ratio includes the cost of the intervention compared to any cost savings (both healthcare cost saving and the monetary value of avoiding absence from work, staff not fully functioning at work and staff turnover). Cost effective interventions using this decision criterion have a ROI greater than \$1, this means that the cost savings are greater than the costs of the intervention e.g. a ROI of \$1.50 means that for every \$1 invested \$1.50 will be gained.

The scientific evidence that was evaluated to estimate the effectiveness of this intervention¹ found that eSMI can reduce depression diagnoses by 21% in the year after the intervention is implemented and 25% in the following year.

¹ Further details of the evidence summary for eSMI in the workplace are available in the full report describing this work.

Assumptions

To model the intervention costs, two assumptions were made. Firstly, it was assumed that trained staff (e.g. psychologists) and the necessary infrastructure are already available to deliver the intervention. Secondly, it was assumed that the implementation of the intervention would be as described in the published studies, although some studies were conducted under ideal conditions that may or may not reflect real world conditions. The cost of the intervention was calculated by adding up the costs of recruitment, screening and eSMI delivery costs.

Recruitment costs. It is assumed that one administrative staff member within each business will spend two hours to create and distribute digital pamphlets on the company's intranet or via email to advertise the intervention and encourage staff to participate.

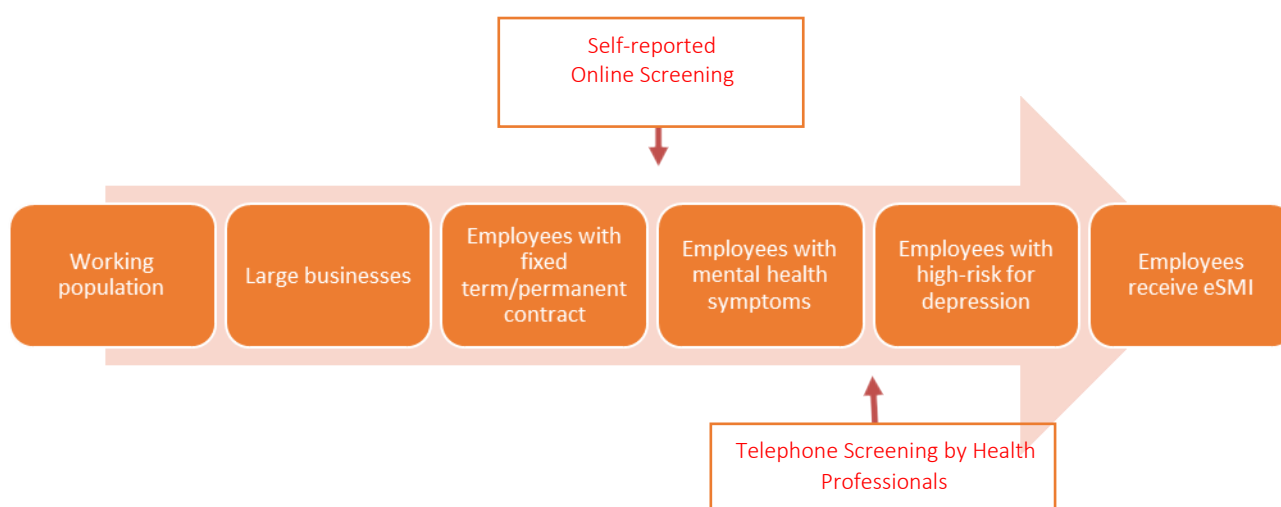
Screening costs. The first stage, comprising self-administered screening using an online screening process incurred \$0 costs, as this is very brief and automated. The second stage involved telephone screening by a health professional.

For those who completed the second stage of screening, it is assumed that a health professional took 33 minutes to complete a diagnosis screening by phone plus 10 minutes preparation for each participant. At least five phone calls were made to people who had completed the self-administered screening to try and engage them with the second stage of telephone screening. If an employee declined to participate when called, they were not contacted further.

eSMI delivery costs. The cost to participants of the program subscription was estimated at \$56². Like other ROI studies in this area, an explicit dollar value of time required to complete the interventions was not included. The costs for the guided self-help component of the intervention were calculated by adding the total cost of psychologists (who provide feedback to participants over the course of the intervention) and the total cost of administrative staff (who assist with the setting up and monitoring the program and send reminder emails to encourage participants to complete intervention sessions in order to minimise the risk of non-completion from employees).

Cost savings. The total annual societal costs of a case of depression for Australian employees (including costs associated with the provision of healthcare services, productivity losses, and job turnover) was estimated to be \$10,129 (5). In other words avoiding one case of depression would result in \$10,129 being saved.

Figure 1. e-Health Stress Management Intervention Pathway



² The cost of the program was estimated by applying the cost of another e-Health program for mental health issues, the 'This Way Up' program, as a proxy for the cost of providing such online interventions.

Results

Cost effectiveness findings

Results are presented in Table 1. In summary, the total cost of providing eSMI to all eligible employees in Australia (i.e. those with mental health symptoms but not a full diagnosis) is approximately \$6.2M. Results showed that eSMI could help avoid absences from work and staff not fully functioning in the workplace to the value of \$6.4M for the employer. There was also a reduction in mental health services and medications used by workers to the value of \$0.1M.

Putting the intervention cost in relation to those cost savings (both health related cost savings and productivity gains), the estimated ROI ratio is 1.05. That is, for every \$1 invested, \$1.05 is gained indicating that the costs of the intervention are less than the cost savings, hence this intervention represents good value for money.

With regard to the health effects, providing eSMI prevented **631 cases of depression** and resulted in a total of **223,661 depression free days** over 11 years. The savings per case of depression prevented were \$494.

Given that all economic modelling studies are subject to some assumptions, a sensitivity analysis ("what if" analysis) was completed to test the assumptions built into the modelling. In the sensitivity analysis, we assumed that the actual total cost savings were 20% higher, this led to a ROI ratio of 1.28.

Table 1. Summary of results (total for the population) for the eSMI workplace intervention

	Year 1	Year 2	Year 3	Year 4	Year 5-11	Total
Intervention costs	\$6.20M	0	0	0	0	\$6.20M
Government	\$6.07M	0	0	0	0	\$6.07M
Employer	\$0.13M	0	0	0	0	\$0.13M
Cost saving (savings if negative)	-\$1.27M	-\$2.86M	-\$1.82M	-\$0.29M	-\$0.27	-\$6.51M
Government	-\$0.02M	-\$0.05M	-\$0.03M	-\$0.01M	-\$0.01M	-\$0.12M
Employer	-\$1.25M	-\$2.81M	-\$1.78M	-\$0.28M	-\$0.27M	-\$6.39M
Total costs	\$4.93M	-\$2.86M	-\$1.82M	-\$0.29M	-\$0.27	-\$0.31M
ROI	0.21	0.67	0.96	1.01	1.05	1.05
Depression free days	45,600	102,112	64,326	9,180	2,443	223,661
Depression case prevented	125	288	187	27	4	631
Yearly cost per depression case prevented	\$39,465	\$5,006	\$412	-\$67	-\$494	-\$494

Notes: ROI: return on investment per \$1 invested

Implementation considerations

While evidence on cost effectiveness is the focus of this project, there are other criteria apart from cost effectiveness that can influence whether and to what degree interventions are likely to be rolled out in routine practice. These criteria are not captured in the technical cost effectiveness results but are very important from a decision making context. Some of these considerations are summarised in the Table below. The colour coding of each criterion is an attempt to visually summarise whether these secondary considerations impact on the results in a positive or negative way (red = negative, amber = uncertain, green = positive). A code of 'green' implies that the secondary consideration strengthens the case for investing in the intervention. A code of 'amber' means that the secondary consideration reduces certainty in the case for investing and a code of 'red' means that these considerations do not support investment in the intervention.

Implementation considerations		Overall Rating
Potential secondary effects	Broader impacts of this intervention on co-workers, families and carers of the employees have not been formally considered. It is likely that the e-Health intervention would have a positive impact on these individuals due to decreased burden of care, and reduced presenteeism. It is noteworthy that the estimated costs for carers in Australia are substantial given the projected \$13.2 billion which would be required to replace informal mental healthcare with formal support services (19-20). Furthermore, other mental health improvements aside from the potential impact on depression have also not been considered in the modelling. Thus, this analysis may underestimate the potential benefits accrued by reducing levels of stress, with positive effects on both physical and mental health.	Positive
Equity	This intervention has potential to decrease inequities given that it is delivered to employees with symptoms who are more likely to develop a mental illness but are not yet ill. This would usually not make them a priority if seeking support in the public mental health system where treatment is prioritised over prevention. The intervention is available only to people with access to the internet. Generally, most working Australians will have internet access, although internet speeds are slower in rural and remote communities. Therefore while access may be increased to a greater proportion of the population (therefore decreasing inequities), there may be some segments of the population (e.g. in rural and remote areas) where access may still be problematic. While this is a workplace initiative, where employees actually complete the screening and the intervention is unclear (i.e. at work or in their own time). Further, the impact on employees in small and medium businesses is currently unknown.	Uncertain
Strength of evidence	The quantity and quality of evidence supporting the effectiveness of workplace interventions was moderate with a limited number of studies that reported depression diagnosis as an endpoint. The evidence was also limited to two year follow up after the intervention was delivered.	Uncertain
Acceptability	It is likely that this intervention will be highly acceptable to both employees and employers (especially considering the intervention costs are low), although time to complete the actual intervention may be an issue (e.g. work versus personal time). There may be some issues of stigma arising as the intervention is not universal but targets particular individuals who are at risk of developing a mental illness, though the results of the screening and completion of the intervention can be kept confidential by the employee if they wish to do so.	Positive
Feasibility	There is a question of an employee's commitment to complete the entire intervention program as it was initially designed and tested. There is a tendency highlighted in many studies of e-Health interventions without a guided component, for people to start but not successfully complete each of the required elements. Feasibility may also depend on companies' willingness to support employees to participate in the interventions, e.g. by allowing it to be done during work hours.	Uncertain
Sustainability	Given such interventions are already available within the Australian setting, particularly via organisations such as the BlackDog Institute and beyondblue, they are likely to be quite sustainable to implement over the longer term. However, this will also depend on the Australian Government's willingness to continue to financially support online interventions such as 'MoodGYM'. One limitation to sustainability for employers is that it is unclear who pays for the "guided" component of these interventions and how the costs of the second screening stage will be administered. Currently, the Australian Government supports some but not all of the available guided e-Health interventions, so employers would need to fund the components that do not have other sources of funding in order to implement to full intervention.	Positive

Recommendations

The provision of e-Health interventions is likely to result in productivity savings which are greater than the costs of implementing such interventions. It is recommended that such interventions are considered for provision by employers, starting within the large organisational context (organisations with over 200 employees) and rolled out to smaller organisations as evidence of impact in these settings becomes available. Companies and agencies involved in trials that evaluated e-Health interventions were supportive, suggesting that it would fit well into the routine operations of many organisations. e-Health programs that might be suitable for such an intervention and are currently available in Australia include: MoodGYM, This Way Up, or Mindspot. Scaling up e-Health interventions and large scale roll out would involve raising awareness of these programs (perhaps even with some minor modifications) amongst both employers and employees, and marketing them for the purpose of prevention.

Importantly, there may be low rates of uptake and completion of e-Health interventions in practice without support structures in place for employees to start and complete the full program. Therefore, it may be preferable if employers provide support or encouragement for employees to complete the intervention rather than making it entirely self-directed. Similarly, the guided versions of e-Health are preferred since this format has been found to increase compliance of employees completing the program.

Results from this study are based on assumptions that may not have fully captured implementation issues that may occur in practice. One issue that employers need to consider is how they will use the information provided at screening as well as information gathered during the intervention. Employees may have concerns about the privacy and confidentiality of health related information being made available to employers if they participate in the intervention. Another issue for employers to consider is whether they would support employees to complete the intervention in work time. Allowing employees to complete the intervention in work time would increase the cost of implementing the intervention, but may increase the willingness of employees to complete the whole program.

Take home messages

e-Health programs are a cost effective option to assist employees at risk of developing depression. A number of e-Health programs are already available in Australia. Scaling up the roll out of these e-Health programs would involve raising awareness amongst employers and employees of their availability. Only programs that have been evaluated for effectiveness should be promoted in this way. There is an issue with ensuring employees complete the intervention once started, however this is an issue for all e-Health interventions (both prevention and treatment). One approach for employers to consider is integrating the completion of the e-Health intervention into internal policies on mental health in the workplace, so that it is part of the standard package of training for employees. Employers also need to consider how they will handle the information obtained from employees during the screening process and communicate openly with employees about how the information will or will not be used.

References

1. Goetzel RZ, Hawkins K, Ozminkowski RJ, Wang S. The health and productivity cost burden of the "top 10" physical and mental health conditions affecting six large US employers in 1999. *Journal of occupational and environmental medicine*. 2003;45(1):5-14.
2. Wang PS, Beck A, Berglund P, Leutzinger JA, Pronk N, Richling D, et al. Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys. *Journal of Occupational and Environmental Medicine*. 2003;45(12):1303-11.
3. Hilton MF, Scuffham PA, Sheridan J, Cleary CM, Whiteford HA. Mental ill-health and the differential effect of employee type on absenteeism and presenteeism. *Journal of Occupational and Environmental Medicine*. 2008;50(11):1228-43.
4. Sanderson K, Tilse E, Nicholson J, Oldenburg B, Graves N. Which presenteeism measures are more sensitive to depression and anxiety? *Journal of affective disorders*. 2007;101(1-3):65-74.
5. Cocker F, Sanderson K, LaMontagne AD. Estimating the economic benefits of eliminating job strain as a risk factor for depression. *Journal of occupational and environmental medicine*. 2017;59(1):12-7.
6. Cocker F, Nicholson JM, Graves N, Oldenburg B, Palmer AJ, Martin A, et al. Depression in working adults: comparing the costs and health outcomes of working when ill. *PLoS one*. 2014;9(9):e105430.
7. Lee Y-C, Chatterton ML, Magnus A, Mohebbi M, Le LK-D, Mihalopoulos C. Cost of high prevalence mental disorders: findings from the 2007 Australian National Survey of mental health and wellbeing. *Australian & New Zealand Journal of Psychiatry*. 2017;51(12):1198-211.
8. McTernan WP, Dollard MF, LaMontagne AD. Depression in the workplace: An economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work & Stress*. 2013;27(4):321-38.
9. Mental Health Australia, KPMG. Investing to Save: The Economic Benefits for Australia of Investment in Mental Health Reform. KPMG, 2018.
10. Hedman E, Ljótsson B, Lindefors N. Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness. *Expert review of pharmacoeconomics & outcomes research*. 2012;12(6):745-64.
11. Heber E, Ebert DD, Lehr D, Cuijpers P, Berking M, Nobis S, et al. The benefit of web- and computer-based interventions for stress: a systematic review and meta-analysis. *Journal of medical Internet research*. 2017;19(2).
12. Carolan S, Harris PR, Cavanagh K. Improving employee well-being and effectiveness: systematic review and meta-analysis of web- based psychological interventions delivered in the workplace. *Journal of medical Internet research*. 2017;19(7).
13. Lim D, Sanderson K, Andrews G. Lost productivity among full- time workers with mental disorders. *The journal of mental health policy and economics*. 2000;3(3):139-46.
14. Gulliver A, Griffiths KM, Christensen H. Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. *BMC Psychiatry*. 2010;10(1):113.

15. Ebert DD, Cuijpers P, Muñoz RF, Baumeister H. Prevention of Mental Health Disorders Using Internet- and Mobile-Based Interventions: A Narrative Review and Recommendations for Future Research. *Frontiers in psychiatry*. 2017;8:116.
16. Geraedts AS, Kleiboer AM, Wiezer NM, van Mechelen W, Cuijpers P. Short-term effects of a web-based guided self-help intervention for employees with depressive symptoms: randomized controlled trial. *Journal of medical Internet research*. 2014;16(5).
17. Ebert DD, Lehr D, Boß L, Riper H, Cuijpers P, Andersson G, et al. Efficacy of an internet-based problem-solving training for teachers: results of a randomized controlled trial. *Scandinavian journal of work, environment & health*. 2014:582-96.
18. Heber E, Lehr D, Ebert DD, Berking M, Riper H. Web-based and mobile stress management intervention for employees: a randomized controlled trial. *Journal of medical Internet research*. 2016;18(1).
19. Australia C. The economic value of informal care in Australia in 2015. Carers Australia, Canberra, ACT. 2015.
20. Diminic S, Hielscher E, Lee YY, Harris M, Schess J, Kealton J, et al. The economic value of informal mental health caring in Australia. MIND Australia. 2017.