



Pearson

MEASURING CHANGES IN DEPRESSION, ANXIETY, STRESS & WELLBEING IN A 75-DAY WORKPLACE ACTIVITY CHALLENGE

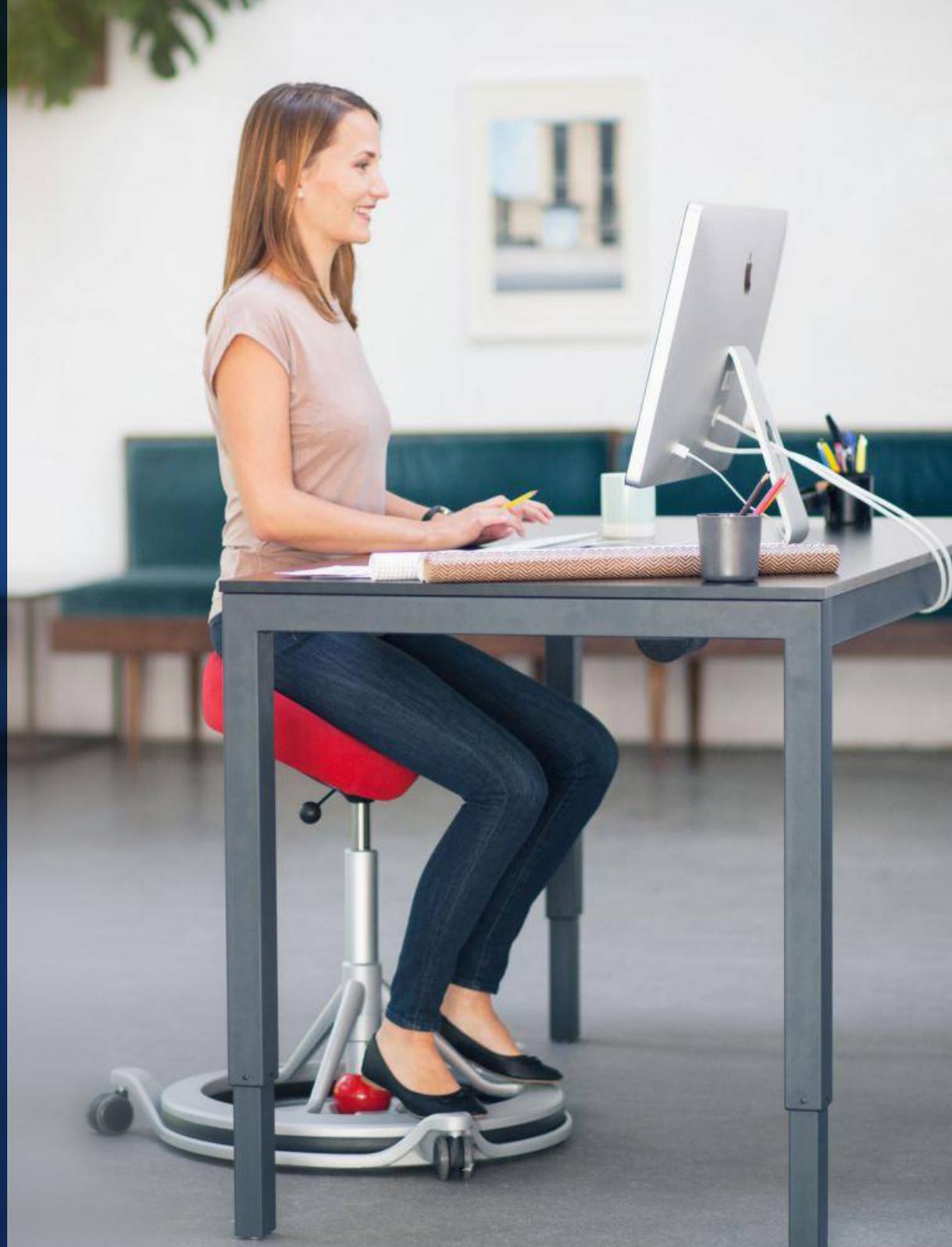
Bilsborough S, Ganesan A,
De Courten M, Krishnan RV, Demarte W





The World Health Organization defines health as "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The workplace provides an ideal setting to undertake 'health' promotion programs, and analysis of these programs, as most of the adult population spends considerable time at work. Stepathlon, in partnership with WHO member, Professor Maximillian de Courten from Victoria University and Associate Professor Anand Ganesan, cardiologist from Flinders University, using global best practices, has undertaken significant research into mental and physical health in the workplace. The subsequent white paper outlined here is a direct reflection of our published research into mental health.

Pearson is the world's leading learning company, with 32,000 employees across 70 countries worldwide. We work with students, teachers, instructors and institutions to help people of all ages to make measurable progress in their lives through learning. This is achieved through educational content, multimedia learning tools and technologies, assessments and services.



EXECUTIVE SUMMARY



Measuring changes in mental health in the workplace is almost non-existent



Pearson and Stepathlon have undertaken an analysis of depression, anxiety, stress and mental wellbeing over two years, using validated scientific survey based tools

2016:

Depression -24.8%,
Anxiety -29.5%,
Stress -5.5%

2017:

Depression -11.8%,
Anxiety -33.2%,
Stress -24.2%

Measurement and Evaluation based on published research ["Happy feet": evaluating the benefits of a 100-day 10,000 step challenge on mental health and wellbeing. Hallam KT, Bilsborough S, de Courten M. BMC Psychiatry. 2018 Jan 24;18(1)]



Pearson

Pearson is one of the first organisations to effectively measure changes in mental health in the workplace



BACKGROUND

In a 2011 editorial in the prestigious British Journal of Psychiatry, British psychiatrist, researcher and professor of community psychiatry at King's College London, Graham Thornicroft, shed some important light on mental health (Ivbijaro 2011). He noted that life expectancy for men who suffer from mental illness continues to be 20 years less than the general population, and for women who suffer from mental illness 15 years less. Nearly seven years later, mental health remains at the zenith of wellbeing 'issues' both socially and in the workplace. The deadly triad; depression, anxiety and stress continue to be the causes of mental ill-health. There has also been growing interest in measuring mental wellbeing, (defined by different authorities as various combinations of optimum functioning and feeling), recognising that mental health is more than the absence of mental illness. While companies and organisations continue to invest significant funds to halt the rising tide of mental ill-health, the measurement and evaluation of changes in mental health has been severely lacking. Hence the question abounds, "How do we measure changes in mental health?"



Research by Finder.com.au estimating 3.74 million Australians used at least one day of their sick leave for mental health or stress in the past 12 months. It found 31 per cent of the Australian workforce has used their leave for mental health or stress within the last year. Mental health is estimated to cost the Australian economy at least \$881 million a year in sick days alone (Finder.com 2018)



stepathlon

INTRODUCTION

Investment in mental health not only saves lives but also protects those with mental illness from the catastrophic financial consequences of poor mental health. Yet for most people with mental illness access to mental health services and treatment remains an aspiration, and not the reality (Ivbijaro Jun 2011).

According to *The Global Economic Burden of Non-Communicable Diseases, Program on the Global Demography of Aging*, by 2030 mental illness is projected to cost the global community over US\$6 Trillion (Bloom 2012). Alramingly, this places the impact of mental health beyond that of cardiovascular disease, diabetes, and cancer.



People who experience mental illness are known to be at a much higher risk for morbidity and early mortality from physical health issues than the general population. Around 45 per cent of Australians between the ages of 16 and 85 experience a mental health condition at some point in their lifetime. In a given 12-month period, 20 per cent of Australians will have experienced a mental health condition (ABS 2007).

The deadly triad of mental ill-health consists of depression, anxiety and stress.



DEPRESSION

Depression is an important, yet common cause of morbidity and mortality across the globe.

Conventional treatment of depression is antidepressants and/or psychological therapy. The positive effect of physical movement on depression is believed to be multifactorial. In the Western world, physical exercise is considered part of a healthy lifestyle and the depressed individuals who exercise regularly can expect positive feedback from their environment and social contact.

Movement/Exercise is a normal activity that can lead to a positive cycle, i.e., the person engaging in physical exercise feels normal. Physical activity at a relatively high intensity makes it difficult to simultaneously think/worry excessively, and physical activity can be used as a distraction from sad thoughts (Scott 1960).

ANXIETY

Anxiety disorders are the most common mental health problem globally (Burton 2013). An estimated 5% of the adult population is currently suffering from morbid anxiety. In the course of a year, approximately 7% of the population will experience some form of anxiety disorder, while 15% will experience having an anxiety disorder during their lifetime. Women experience anxiety twice as often as men, with the exception of obsessive compulsive disorder (OCD) and fear of illness (hypochondria), where the frequency is the same for both sexes. (Pederson 2015).

The exact causes of anxiety are unknown, but it is often a case of a combination of biological vulnerability and stress during childhood or later in life. The severity of the anxiety may vary over time and spontaneous improvement can occur. Without treatment, many people experience long-term or chronic disablement. Epidemiological studies indicate that regular physical activity helps to prevent symptoms of anxiety, but there are no studies that shed light on whether a causal relationship exists (Pasco 2011).



stepathlon

STRESS

Stress is a common occurrence in everyday life and repeated or traumatic stress can be a precipitating factor for illnesses of the central nervous system, as well as peripheral organ systems. Stress alone is not a disease, but long-term stress can lead to illness. Thus, severe or long-term psychological stress can not only induce depression, a leading illness worldwide, but can also cause psychosomatic diseases such as asthma and rheumatoid arthritis (Pederson 2015).

There is thus some evidence in scientific literature to suggest that regular exercise and being physically fit can reduce stress levels. The higher one's level of physical fitness, the lesser the degree of perceived stress. There are divergent research findings in terms of whether to exercise at a high or moderate intensity to avoid stress, but aerobic exercise seems to have a better effect than strength training (Pederson 2015).



MENTAL WELLBEING

There has been growing interest in measuring mental wellbeing, recognising that mental health is more than the absence of mental illness (Dolan 2007). Mental wellbeing has been defined by different authorities as various combinations of optimum functioning and feeling. Mental wellbeing has been found to

have a U-shaped relationship with age. It is linked with good physical health and with longevity among older adults. Its relationship with social and economic circumstances is complex (Fat 2017).



stepathlon

PHYSICAL MOVEMENT

Physical activity/movement/incidental activity represents a cornerstone in the primary prevention of at least 35 chronic conditions (Booth 2007), including areas such as heart disease, high cholesterol, high blood pressure, breast and colon cancer, high blood sugar, and stroke. While physical activity has been shown to be also beneficial for people with severe depression (Stanton 2013), and has become an important focus in recent times, it is certainly an underutilized tool. Large studies have demonstrated that adequate physical activity is associated with fewer depressive symptoms and the most recent of these meta-analyses showed that in clinically depressed individuals, exercise has a moderate effect on symptoms of depression, highlighting its place as an adjunct treatment option (Cooney 2013).

Incidental activity, measured by daily walking steps has been an area of focus, especially in the workplace. The focus has primarily been on taking 10,000 steps a day for better health. 10,000 steps roughly equate to 6.5 to 8 km of walking per day (around 1.5 to 2 hours of walking). This level of activity well exceeds the WHO Global Strategy on Physical Health, Diet and Activity recommendations of 150 minutes of moderate physical activity per week.

In this white paper we discuss the impact of using a 75-day pedometer-based activity challenge to measure and evaluate changes in mental health; on the psychological factors of wellbeing, stress, anxiety and depression.





METHOD

There are many purported ways of measuring and evaluating mental health. Fortunately, there is a correct and incorrect way, and the correct way requires the use of global best practice common processes and evaluation tools. The tools used in this paper are based on those used for published research, hence they have been highly scrutinized by the peer review process. This includes the correct storing of data and obtaining ethics approval.



According to the Black Dog Institute, an app for depression is released once every three days, and only 40% remain after 9-months. The most common type of app was symptom and mood monitoring (43%), followed by apps containing information about the condition (38%).

Unfortunately, two-thirds of the mood monitoring apps used mood scales that weren't specific to bipolar disorder; and information apps only covered 2 out of 13 evidence-based guidelines (**BlackDog Institute 2017**).

ETHICS APPROVAL

Participants of this workplace activity challenge were provided with participant information and consent forms inviting them to this research charting the impact of the 10,000-step challenge on their mental health and wellbeing. The project was approved by the Victoria University Human Research Ethics Committee (HRE15-168).



Symptoms of depression, anxiety and stress were assessed using the short form of the Depression, Anxiety and Stress Scales (DASS). The short form DASS is a 21-item, self-reported, symptom-oriented measure consisting of three sub scales: Depression, Anxiety and Stress. Participants rated their experience of each indicator across a four-point frequency (from 0 [did not apply to me at all] to 3 [applies very much to me or most of the time]). The DASS has strong construct validity, adequate discriminant and convergent validity and internal consistency.

The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) is a 14-item measure rated on a 1-5 scale (from 'none of the time' to 'all of the time'). The scale focuses on positive elements of wellbeing and is positively worded throughout. The scale provides a one factor model for measuring wellbeing. The WEMWBS shows strong criterion validity with the WHO Wellbeing Index-5, Positive and Negative Affect Schedule and is negatively correlated with the General Health Questionnaire-12 measure of mental ill health.

Participants were recruited from Pearson globally. Pearson had 314 participants complete the pre-event survey and 175 complete the post (56%). This workplace activity challenge was promoted at participating sites via posters, e-flyers, and through engagement of senior management. The challenge has been implemented across the Pearson businesses as part of the Asia Pacific regions wellbeing program.

All participants completed the standard demographics questionnaire and logged their daily step count for as many as 75 days during the challenge. Participants could use their own pedometer, or activity monitoring device and recorded their daily totals via the Stepathlon user portal. Through this portal they received regular newsletters, updates and motivational articles for the duration of the challenge. In addition to the standard step challenge package, consenting participants completed a pre and post 75-day challenge questionnaire regarding their mental health using the DASS-21 and WEMWBS questionnaires in English.

The results were analysed by Professor Anand Ganesan of Flinders University in Adelaide, Professor Maximillian de Courten from Victoria University in Victoria and Shane Bilsborough.



RESULTS

OVERALL DATA FOR 2017

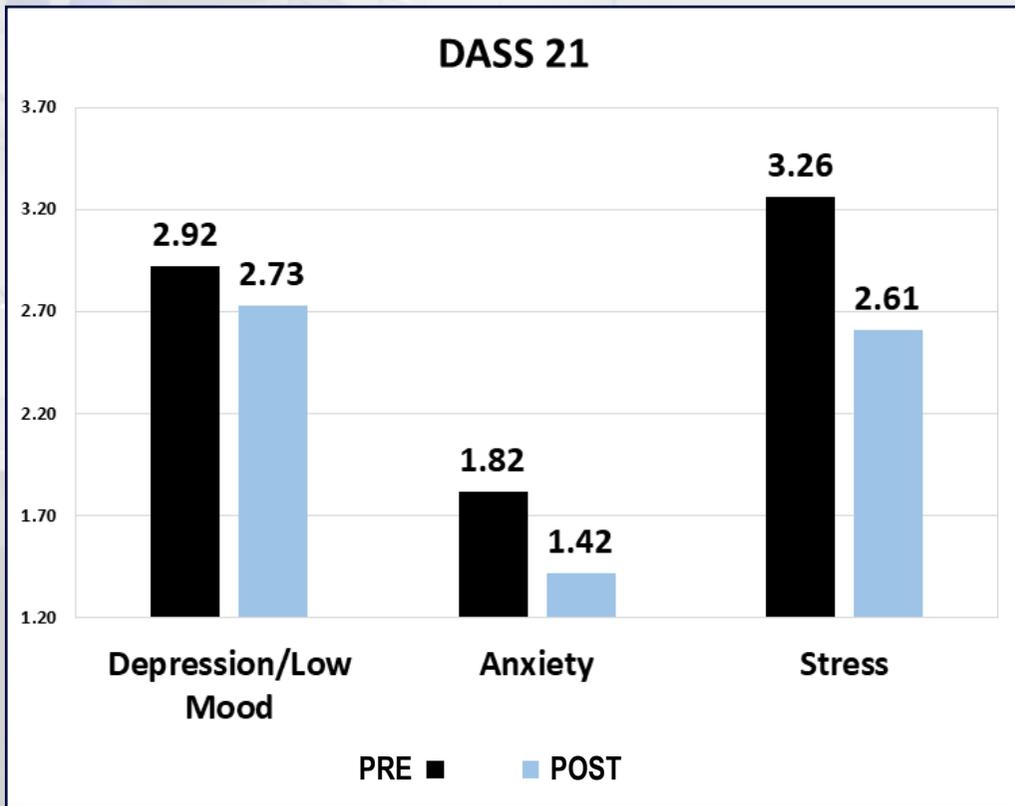


Figure 1.1 2017 Mean changes in depression/low mood, anxiety and stress during a 75-day activity challenge.

Figure 1.1 shows changes in depression/low mood, anxiety and stress over the 75-day challenge in 2017. These scores translate to a percentage change of -11.8% for depression/low mood, -33.2% for anxiety and -24.5% for stress.

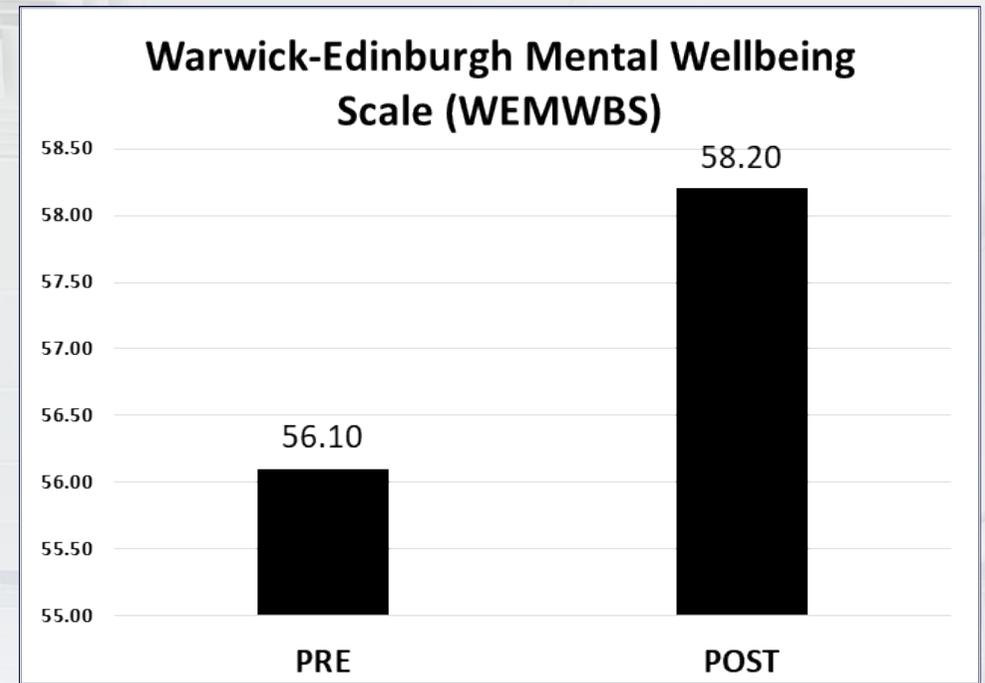


Figure 1.2: 2017 changes in the Warwick-Edinburgh Mental Well-being Scale (WEMWBS).

Figure 1.2 describes the changes in the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). These changes describe a mean increase in mental wellbeing of 3.1%, experienced by 56.3% of participants.

2-Year Data (2016-2017)

Figure 1.3 shows the changes in DASS 21 depression scores for 2016-2017. In 2016 depression scores decreased by 24.5%, while as previously shown, in 2017 depression/low mood decreased by 11.8%.

Figure 1.4 shows changes in DASS 21 anxiety scores for 2016-2017. In 2016 anxiety scores decreased by 29.9% while as previously shown, in 2017 anxiety scores dropped by 33.2%.

Figure 1.5 shows the changes in DASS 21 stress scores from 2016-2017. In 2016 stress scores decreased by 5.5%, while as previously shown in 2017, stress scores decreased by 24.5%.

Figure 1.6 describes the changes in Warwick-Edinburgh Mental Wellbeing Scale. 2016 Vs 2017. In 2016 scores increased by 5.5%, while in 2017 scores increased by 3.1%

Figure 1.7 describes the changes in depression/low mood scores across Pearson globally. The percentage changes are described in Table 1.

The results from figures 1.7, 1.8 and 1.9 were obtained from the global workforce. In some regions the number of participants that completed the post event survey was small, while in others it was quite large. India for example was removed from the analysis for this reason.

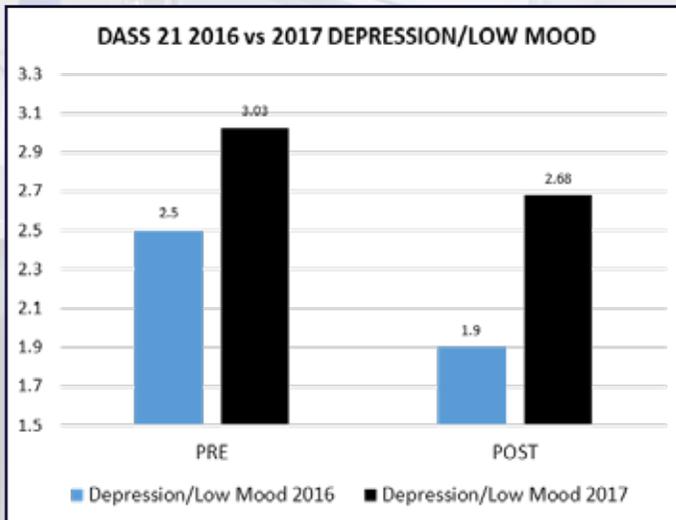


Figure 1.3 Changes in DASS 21 Depression/low mood scores 2016-2017

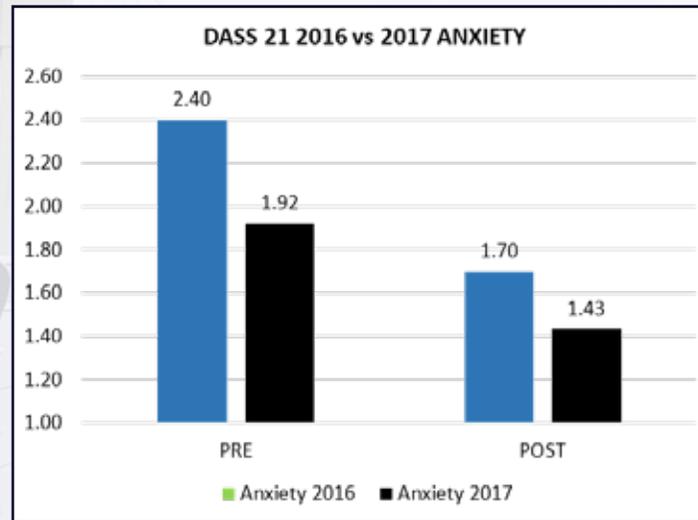


Figure 1.4 Changes in DASS 21 Anxiety scores 2016-2017

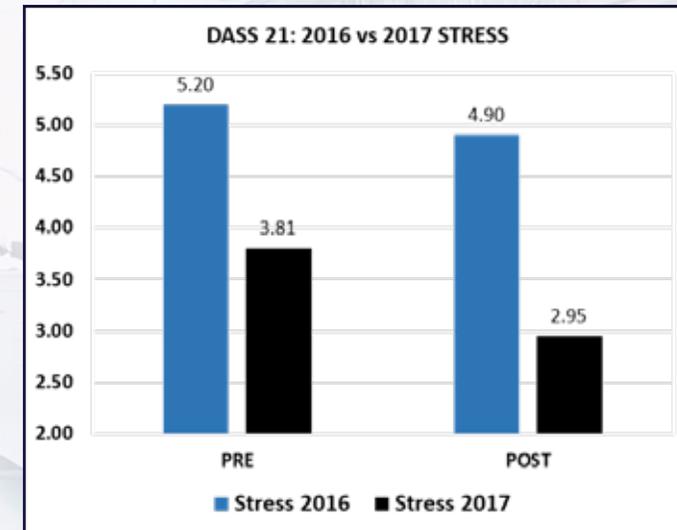


Figure 1.5 Changes in DASS 21 Stress scores 2016-2017

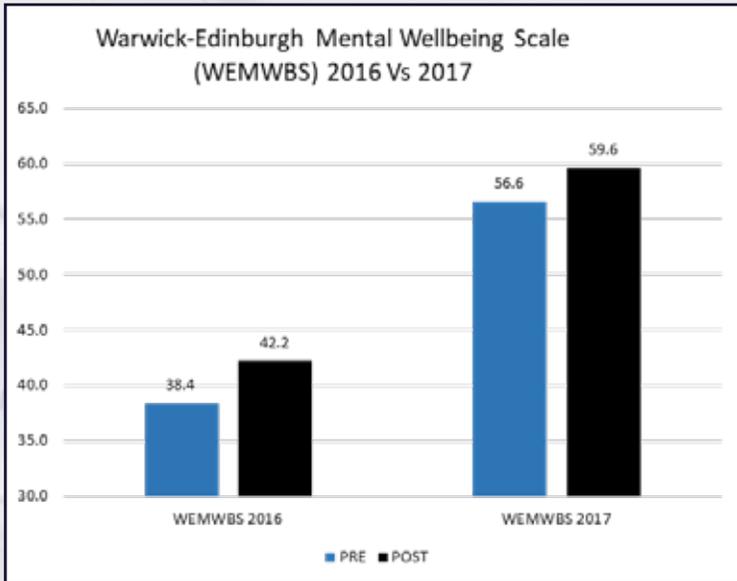


Figure 1.6 Changes in Warwick-Edinburgh Mental Well-being Scale (WEMWBS) 2016 Vs 2017

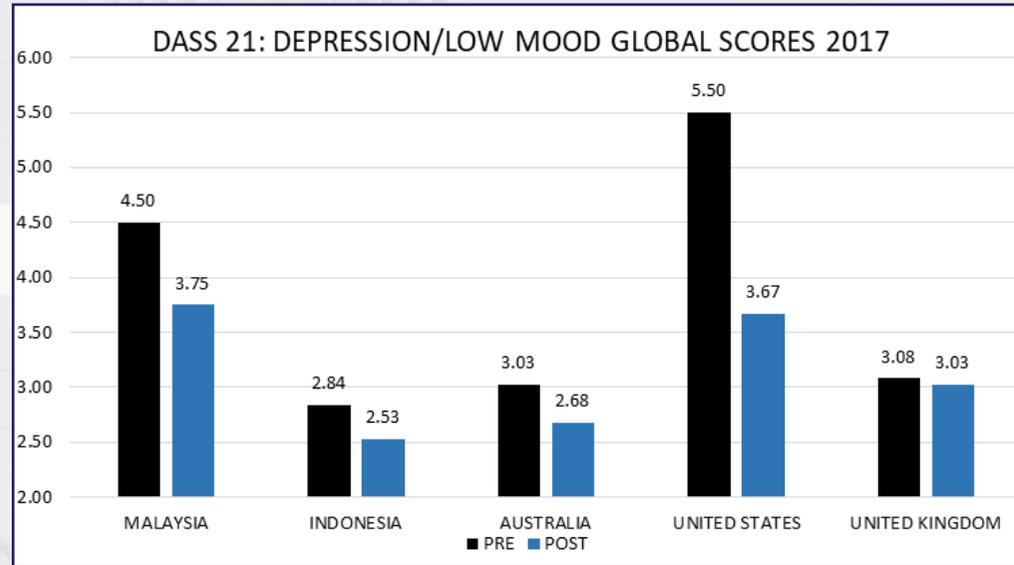


Figure 1.7 2017 Mean changes in depression/low mood during a 75-day activity challenge across Pearson globally

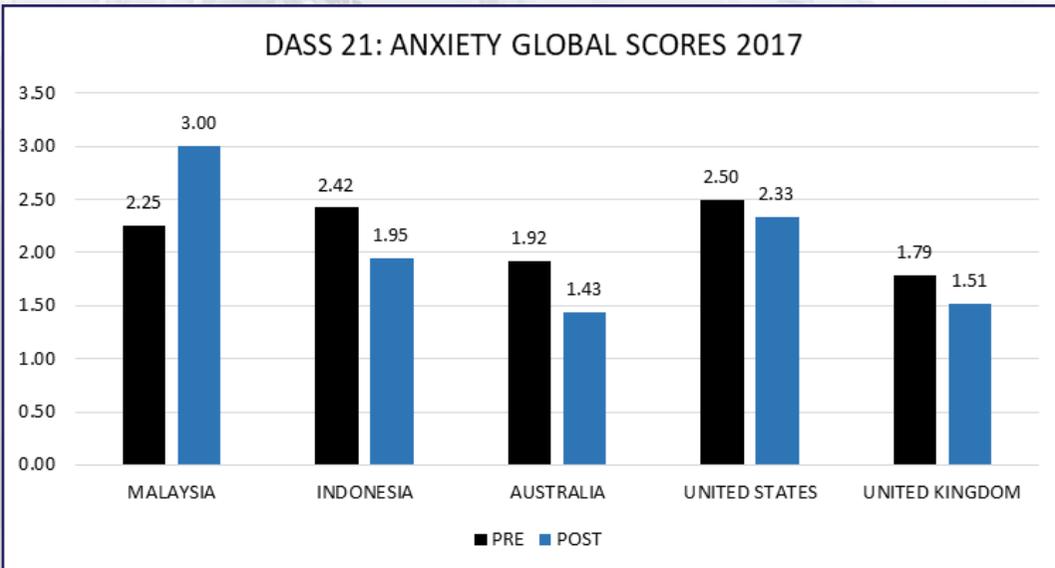


Figure 1.8: 2017 Mean changes in anxiety during a 75-day activity challenge across Pearson globally

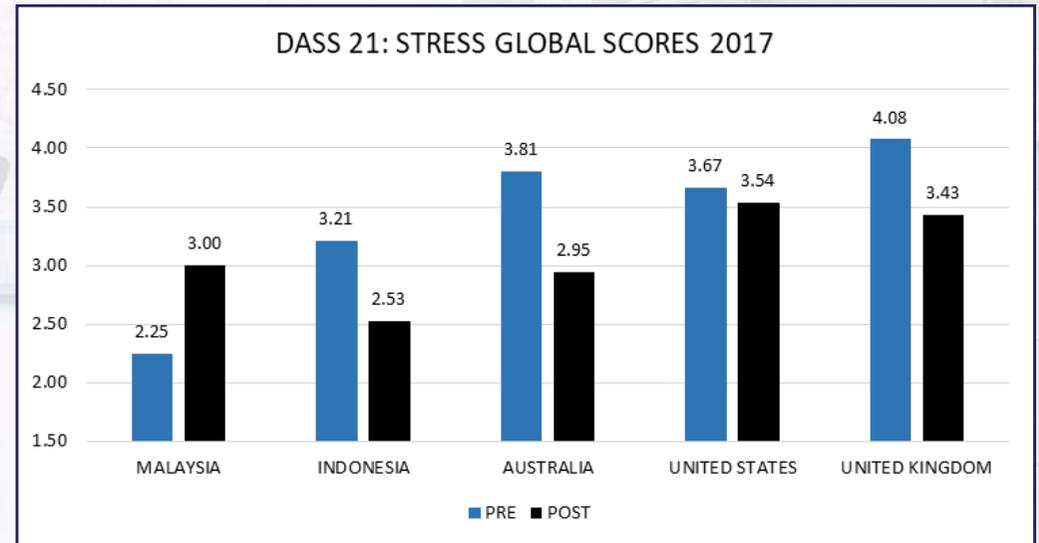


Figure 1.9: 2017 Mean changes in stress during a 75-day activity challenge across Pearson globally

DEPRESSION (% CHANGE)

MALAYSIA



-16.7%

INDONESIA



-24.1%

AUSTRALIA



-11.8%

UNITED STATES



-32.7%

UNITED KINGDOM



-23.9%

Table 1.1 2017 % changes in DASS 21 depression/low mood scores Pearson globally

Figure 1.8 describes the changes in anxiety across Pearson globally. The percentage change in each region are shown below in Table 1.2

ANXIETY (% CHANGE)

MALAYSIA



33.3%

INDONESIA



-19.6%

AUSTRALIA



-33.3%

UNITED STATES



-48.0%

UNITED KINGDOM



-23.7%

Table 1.2 2017 % changes in DASS 21 anxiety scores Pearson globally.

Figure 1.9 describes the changes in stress across Pearson globally. The percentage change in each region are shown below in Table 1.3

STRESS (% CHANGE)

MALAYSIA



33.3%

INDONESIA



-21.3%

AUSTRALIA



-22.5%

UNITED STATES



-10.9%

UNITED KINGDOM



-16.4%

Table 1.3 2017 % changes in DASS 21 stress scores Pearson globally.

The results from figures 1.7, 1.8 and 1.9 were obtained from the global workforce. In some regions the number of participants that completed the post event survey was small, while in others it was quite large. India for example was removed from the analysis for this reason.

DISCUSSION

The results of this white paper highlight some psychological and wellbeing benefits of being engaged in a workplace based 75-day activity challenge. The results described above show significant changes in depression/low mood, anxiety and stress, with concomitant increases in mental wellbeing. Of note is that antidepressant medications reduce depression/low mood by approximately 7%, hence the results are both significant and meaningful as described in our published research (Hallam 2018).

Mental health is related to a range of biopsychosocial factors and as a result a range of interventions and approaches may make up sustaining good mental health. The paper by Hallam 2018 demonstrated that engaging in a workplace based step program improved stress levels by 8.9%, signs of depression by 7.6%, anxiety by 5.0% and wellbeing by 2.1% from baseline, and in both 2016 and 2017 results for Pearson significantly exceeded these findings.

These improvements are associated with increases in physical activity, as measured by tracking walking steps using a pedometer. For Pearson the daily walking step average per participant was measured at 11,815 steps per day, the equivalent of about 7.6 km. For women this average was 11,603 steps/day or 7.4 km/day and for men this value was 12,303 or 8 km/day. This is well above the average daily step count found in the workplace of around 3500 steps/day.

In the largest workplace mental health paper, we found that participants who could manage to take over 12,500 walking steps reduced stress levels by 9%. While Pearson participants took slightly less than this mark, stress scores decreased well above this level and highlights the need for future research.



All data in this paper approached statistical significance and this highlights the importance of two important factors for future research and analysis; 1. Obtaining larger numbers at the beginning of the program, and 2. Larger numbers of participants completed the survey. With a global audience it may also be of benefit to obtain significant numbers in each region, so data could reach statistical significance globally.

BENCHMARKING DATA

While this white paper describes the changes in mental health via DASS 21 and WEMWBS scores some companies may want to understand where they rank along with other organisations; i.e. how do their company's mental health compared to others? Figure 1.10 shows graphically where Pearson ranks compared to other Australian companies. This data suggests that levels of depression/low mood, anxiety and stress are relatively low. Table 1.4 describes the changes in percentiles from 2016 – 2017 for Pearson against other Australian organisations.

DASS 21	2016	2017
Depression/low mood	13th	3rd
Anxiety	38th	24th
Stress	81st	33rd

Table 1.4: Changes in percentiles in Depression/low mood, anxiety and stress from 2016-2017 for Pearson

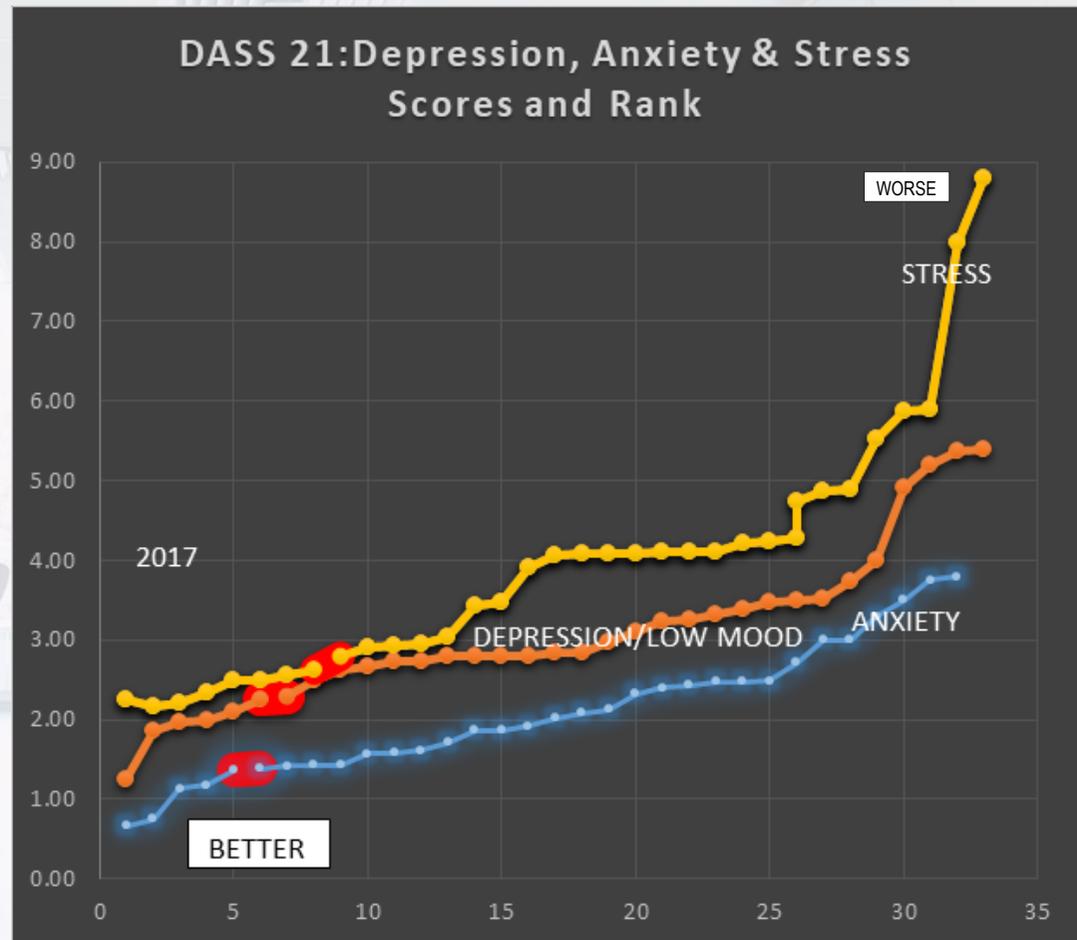


Figure 1.10: Describes the ranking of Pearson (red) in the areas of depression/low mood, anxiety and stress amongst other Australian companies



Evidence shows that workplace-based health promotion programs decrease absenteeism and organisational health care expenditure as described in a systematic review of interventions in large US based firms with an average program duration of 3 years: there the average employee health care costs fell by US\$ 3.3 for every dollar spent on employee wellness programs (Baicker 2010). However, the real value of workplace wellness programs should include outcomes beyond financial or economic factors, such as physical and mental health, quality of life and other, non-health related factors that improve employee wellbeing, satisfaction and reduce turnover (Pronk 2014).

CONCLUSIONS

There is a significant callout from senior management globally to effectively measure and evaluate mental health. We have shown that through a relatively cost-effective activity challenge, based on taking 10,000 steps a day and beyond, with strong roots imbedded in research, we can make significant reductions in depression, anxiety and stress. These changes have been displayed over a two-year period. The challenge is now to track these changes over the long term with a larger sample size.

Hallam et al. *BMC Psychiatry* (2018) 18:19
DOI 10.1186/s12888-018-1609-y

BMC Psychiatry

RESEARCH ARTICLE Open Access

"Happy feet": evaluating the benefits of a 100-day 10,000 step challenge on mental health and wellbeing 

K. T. Hallam^{1,2}, S. Blsborough³ and M. de Courten^{1*}

Abstract

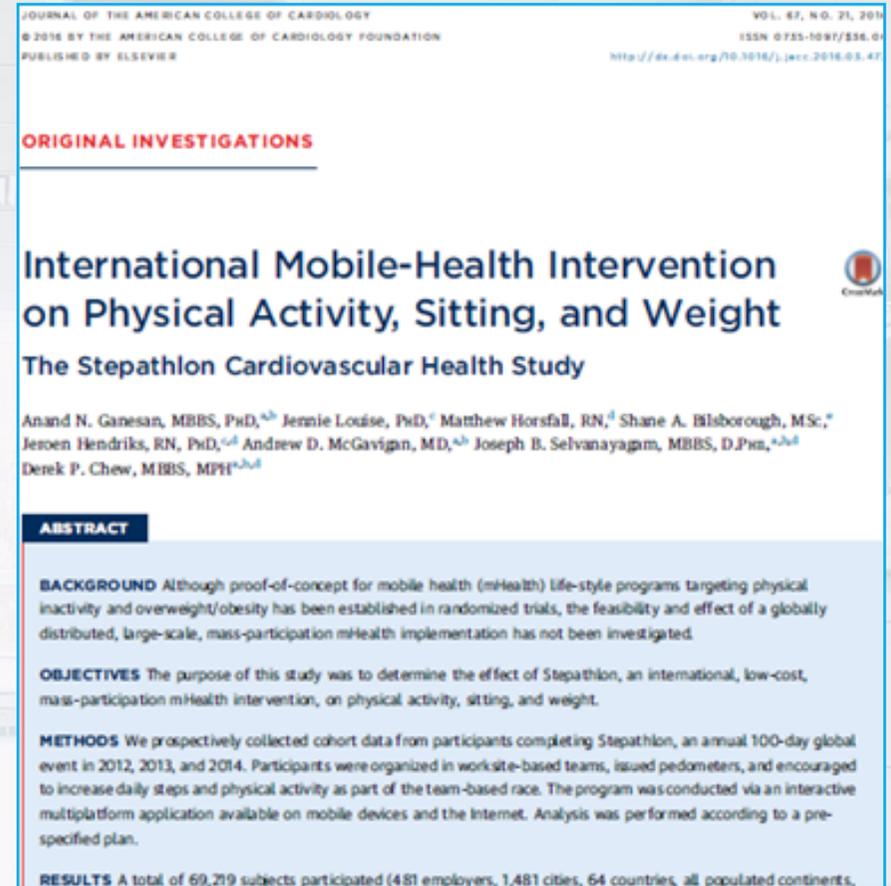
Background: An increased awareness of the health benefits of walking has emerged with the development and refinement of accelerometer equipment. Evidence is beginning to highlight the value of promoting walking, particularly focusing on the Japanese mark of obtaining 10,000 steps per day. Workplace based step challenges have become popular to engage large cohorts in increasing their daily physical activity in a sustainable and enjoyable way. Findings are now highlighting the positive health effects of these medium-term programs (typically conducted over a few months) in terms of cardiovascular health, reducing diabetes risk and improving lifestyle



NEXT STEPS: BENEFITS TO PEARSON

The above body of work highlights what can be achieved in the workplace, especially when it comes to measuring and evaluating changes in mental health. Stepathlon, working with key global universities and associated health professionals have a proven track record of using world's best practice in the areas of mental and heart health and taking this through to publication (as displayed by the two abstracts presented). This exemplifies the highest level of both data collation and analysis.

The data we have gathered and analysed is short term data with a relatively small sample size mainly focussed out of Australia. The following suggestions form part of potential 'Next Steps in Wellbeing' for Pearson.





Measure and evaluate depression, anxiety, stress and wellbeing with a larger sample size.

A sample size of 5000-7500 would be ideal, evenly distributed between men and women. This sample size will allow for greater depth of analysis and more robust results/outcomes.



Track the data longitudinally: Pearson is one of the very few global organisations with two-year data on mental health. Following the above point, a larger sample size would be more beneficial to repeat the intervention over several years, say 3-5, and track changes in depression, anxiety, stress and mental wellbeing. This larger sample size and long-term data will show clearly whether there has been a change or shift in mental health amongst employees. This will also allow us to localise the datasets and undertake a deep dive into mental health changes in all regions of the company.



Analyse the environment of the workplace: For example, what changes have been made across all regions to the 'wellbeing' environment such as the canteen, vending machines, policy changes, etc.



Track other data: In 2017 Pearson also collected data on: (1) Sleep using the PROMIS scale (2) CVD (3) diabetes (4) Nutrition (5) BMI (6) weight & waist. For sleep only 1 year of data exists however two-year data exists for all other variables. We could inculcate a 'resilience scale' into the mix, as well as undertake an extensive CART Analysis (Computer Analysed Regression Tree). This would allow calculations of a whole host of variables such as the relationship between sleep and depression/stress.



Publish: The benefits of a large sample size is the value of gaining statistical significance in the sample. The opportunity then exists to publish the findings. This allows Pearson to be a leader in the mental health space and propagating a solid methodology and process for obtaining these findings and even as importantly gain a higher claim for an employer of choice.



REFERENCES:

- 1.ABS, 2007 National Survey of Mental Health and Wellbeing: Summary of Results, Table 1, 23 October 2008, available<[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/6AE6DA447F985FC2-CA2574EA00122BD6/\\$File/43260_2007.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/6AE6DA447F985FC2-CA2574EA00122BD6/$File/43260_2007.pdf)>.
- 2.Baicker K, Cutler D, Song Z. Workplace wellness programs can generate savings. *Health affairs (Project Hope)*. Project HOPE - The People-to-People Health Foundation, Inc; 2010;29:304–11.
- 3.Black Dog Institute 2017 <https://www.blackdoginstitute.org.au/news/news-detail/2017/03/30/finding-a-mental-health-app-that-works>
- 4.Bloom D, Cafiero E, Jané-Llopis E, Abrahams-Gessel S, Bloom L, Fathima S, et al. The Global Economic Burden of Noncommunicable Diseases. *Program on the Global Demography of Aging*; 2012
- 5.Booth FW1, Lees SJ. *Physiol Genomics*. 2007 Jan 17;28(2):146-57. Epub 2006 Oct 10. Fundamental questions about genes, inactivity, and chronic diseases.
- 6.Cooney GM, Dwan K, Greig CA, Lawlor DA, Rimer J, Waugh FR, et al. Exercise for depression. Mead GE, editor. *Cochrane Database Syst Rev*. Chichester, UK: John Wiley & Sons, Ltd; 2013;62:
- 7.Dolan P, White MP. How can measures of subjective well-being be used to inform public policy? *Perspectives on Psychological Science*. 2007;2(1):71–85
- 8.Mental Health in the Workplace <https://www.finder.com.au/mental-health-in-the-workplace>
- 9.Gabriel Ivbijaro *Ment Health Fam Med*. 2011 Jun; 8(2): 63–64. Mental health: the aspiration to reality gap
- 10.Gabriel Ivbijaro *Ment Health Fam Med*. 2011 Sep; 8(3): 131–132. Mental health as an NCD (non-communicable disease): the need to act
- 11.Hallam KT, Billsborough S, de Courten M. Happy feet": evaluating the benefits of a 100-day 10,000 step challenge on mental health and wellbeing. *BMC Psychiatry*. 2018 Jan 24;18(1)
- 12.Linda Ng Fat, Shaun Scholes, Sadie Boniface, Jennifer Mindell, and Sarah Stewart-Brown; Evaluating and establishing national norms for mental wellbeing using the short Warwick–Edinburgh Mental Well-being Scale (SWEM-WBS): findings from the Health Survey for England *Qual Life Res*. 2017; 26(5): 1129–1144.
- 13.Pasco JA, Williams LJ, Jacka FN, Henry MJ, Coulson CE, Brennan SL, Leslie E, Nicholson GC, Kotowicz MA, Berk M. Habitual physical activity and the risk for depressive and anxiety disorders among older men and women. *Int Psychogeriatr* 2011; 23: 292–298.
- 14.Pederson, K, Saltin B, Exercise as medicine – evidence for prescribing exercise as therapy in 26 different chronic diseases *Scandinavian Journal of Medicine and Science in Sports* 2015; 25:
- 15.Pronk NP. Placing workplace wellness in proper context: value beyond money. *Prev Chronic Dis*. 2014;11:E119.
- 16.Scott MG. The contributions of physical activity to psychological development. *Res Q* 1960: 31: 307–320.
- 17.Stanton R1, Reaburn P2. *J Sci Med Sport*. 2014 Mar;17(2):177-82. doi: 10.1016/j.jsams.2013.03.010. Epub 2013 Apr 18. Exercise and the treatment of depression: a review of the exercise program variables.