

Bond University
Research Repository



Implementation of psychiatric-focused lifestyle medicine programs in Asia

Sarris, Jerome ; Nishi, Daisuke; Xiang, Yu-Tao; Su, Kuan-Pin; Bannatyne, Amy Jean; Oliver, Georgina; Kua, Ee-Heok; Ng, Chee Hong

Published in:
Asia-Pacific Psychiatry

DOI:
[10.1111/appy.12212](https://doi.org/10.1111/appy.12212)

[Link to output in Bond University research repository.](#)

Recommended citation(APA):
Sarris, J., Nishi, D., Xiang, Y.-T., Su, K.-P., Bannatyne, A. J., Oliver, G., Kua, E.-H., & Ng, C. H. (2015). Implementation of psychiatric-focused lifestyle medicine programs in Asia. *Asia-Pacific Psychiatry*, 7(4), 345-354. <https://doi.org/10.1111/appy.12212>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

Implementation of Psychiatric-Focused Lifestyle Medicine Programs in Asia

Jerome Sarris^{1,2} Daisuke Nishi³ Yu-Tao Xiang⁴ Kuan-Pin Su⁵ Amy Bannatyne¹ Georgina Oliver¹ Ee-Heok Kua⁶ Chee Hong Ng¹

¹ The University of Melbourne, Department of Psychiatry, The Melbourne Clinic, Melbourne, Australia

² Centre for Human Psychopharmacology, Swinburne University of Technology, Melbourne, Australia

³ Department of Mental Health Policy and Evaluation, National Institute of Mental Health, National Center of Neurology and Psychiatry, Kodaira, Tokyo, Japan

⁴ Unit of Psychiatry, Faculty of Health Sciences, University of Macau, Macao SAR, China

⁵ Department of Psychiatry & Mind-Body Interface Laboratory (MBI-Lab), China Medical University Hospital, and Graduate Institute of Neural and Cognitive Sciences, China Medical University, Taichung, Taiwan

⁶ Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Word Count: 4200

Corresponding author:

Dr Jerome Sarris

University of Melbourne

Department of Psychiatry

The Melbourne Clinic

2 Salisbury St. Richmond 3121, Victoria, Australia.

Email: jsarris@unimelb.edu.au

Phone: +61 3 94209350, Fax: +61 3 94209351

Abstract

Lifestyle-focused health programs are growing in interest throughout Western society, and a range of lifestyle factors are known to enhance both physical and mental health. However it remains largely unknown as to whether this approach is salient for the Asian context. The major components of lifestyle-focused health programs to enhance mental and physical health are considered to include the evidence-based adoption of physical activity and exercise, dietary modification, general psychoeducation, adequate relaxation/sleep and social interaction, use of mindfulness techniques, the reduction of substance use, attention of intersecting environmental factors, and the potential use of motivation and goal setting techniques. This paper outlines an overview of the evidence underpinning these elements, and discusses potential barriers and challenges, and what logistical considerations may need to be addressed in the implementation of such programs within the context of Asian cultures.

Key words: Lifestyle; Mental Health; Asia; Psychiatry; Exercise; Mindfulness; Diet; Smoking; Alcohol

Running Header: Lifestyle Programs in Asia

OVERVIEW

A critical yet complex nexus between physical and mental health, especially concerning people with mental illness, has been highlighted by an expansive body of research (Stanley & Laugharne, 2014). Further, the strong link between serious mental illness and its treatments with poor physical health and associated increased mortality has been well established (McElroy, 2009). It is widely recognised that modifiable lifestyle components such as diet, exercise, sleep and relaxation, modification of substance use (e.g. nicotine and alcohol), and enhancement of social networks are vital for general mental health (J Sarris, 2014; Stanley & Laugharne, 2014), in addition to the maintenance of physical health. Accordingly, current evidence indicates the need for an integrated health response that supports prevention and early diagnosis, treatment, and management of both physical and mental health problems. To address the interrelationship between poor mental and physical health, lifestyle modification programs primarily focus on exercise and dietary adjustment, typically to treat metabolic issues and weight gain. These programs however have varied success.

To highlight this, an assessment was conducted of 24 lifestyle health programs globally aimed at reducing obesity and improving fitness for persons with serious mental illness (Bartels & Desilets). They found that while participants experienced an overall mean weight loss and/or decrease in body mass index, lifestyle interventions appear to be inconsistently successful in achieving clinically significant results. Programs assessed by the authors to have enhanced success, were of three months or longer in duration, and incorporate both education and activity-based approaches. A comprehensive 'integrative' lifestyle-focused program (LFP) may move beyond a basic model, and consist of the following education and practical components: 1) Dietary education and practical cooking skills; 2) Exercise/Physical activity education and participatory demonstration; 3) General lifestyle and psycho-education; 4) Mindfulness technique instruction; and 5) Motivation and goal setting skills.

In respect to the research underpinning the use of integrative LFPs for mental health conditions, there is currently limited evidence. For example, only one study has examined the effects of combining multiple lifestyle interventions for depression. This randomised controlled trial (Garcia-Toro et al., 2012) involved 80 outpatients with diagnosed major depressive disorder who were taking antidepressant treatment. Four specific lifestyle recommendations consisting of dietary modification, exercise, sunlight exposure and sleep patterns were prescribed in the active group, while the control group was given just general daily patterns to follow. Blinded assessment conducted before and after six months revealed that the active group had a significantly greater reduction of depression than the control group, with 11 out of 40 people in the active group achieving remission ($HAM-D < 7$), compared to only one person in the control group.

There are however marked intrinsic lifestyles differences between Western and Eastern societies, and it is largely unknown how LFPs would operate across diverse cultures in Asia in consideration to differing approaches to prescriptive guidelines; work, lifestyle, environmental, and social factors; in addition to economic considerations. The purpose of this paper is to outline an overview of the evidence underpinning the major components of integrative LFPs for enhancing mental health, and to explore challenges in delivering such programs within the Asian context.

LIFESTYLE PROGRAM COMPONENTS

Diet

In addition to physical activity, dietary modification is the most prevalent behavioural strategy in most LFPs, primarily to reduce body weight (Foster, Makris, & Bailer, 2005), but also to improve mood, self-esteem and quality of life. For example, numerous meta-analyses (Franz et al., 2007; Schaar, Moose-Thiele, & Platen, 2010; T. Wu, Gao, Chen, & van Dam, 2009) have indicated interventions combining diet and exercise strategies produce significantly better long-term outcomes than interventions consisting of diet or exercise only strategies. Altering dietary patterns may affect a variety of factors influencing mental health and the development of mood disorders (Jacka & Berk, 2007; Quirk et al., 2013). Interventions modifying diet may enhance mental wellbeing, as demonstrated in a pilot randomised controlled study (McMillan, Owen, Kras, & Scholey, 2010) which evaluated the effects of dietary change on mood and cognition in healthy individuals. The study showed significant improvements in self-rated vigour, alertness and contentment in the group adhering to 10 days of a nutrient-rich diet compared to the control group.

Further, nutrients critical for neurological function (magnesium, folate, zinc and essential fatty acids) can be found primarily in foods such as leafy green vegetables, legumes, wholegrains, lean red meat and fish. Foods rich in polyphenols (e.g. berries, tea, dark chocolate, wine and certain herbs) are also valuable for cognitive and cardiovascular function (Howes & Perry, 2011; Ross & Kasum, 2002). Introducing dietary modification as part of an LFP for Asian populations should take into account the context of cultural (and religious) considerations regarding cuisine choices and cooking and eating habits. While data supports the adherence to traditional dietary patterns could be beneficial, some 'traditional' dietary patterns may be potentially improved. With an increasing issue of Western 'fast food' infiltrating many Asian countries, it is common sense to advocate a diet based on a balanced wholefood diet low in process foods (Baker & Friel, 2014).

Physical Activity and Exercise

Alongside diet, physical activity (PA) or formal exercise is another key component of most LFPs. Adjunctive PA interventions have been found to significantly reduce depressive symptoms in individuals with mental illness, in addition to improving anthropometric measures (e.g., weight), aerobic capacity, and quality of life (Rimer et al., 2012). Studies in depressed patients revealed that for mild to moderate depression the effect of exercise may be comparable to antidepressant medication and psychotherapy; while serving as a valuable adjunctive therapy for severe depression (Knapen, Vancampfort, Morien, & Marchal, 2014). It is evident that adequate PA and exercise is of synergistic relevance given the increased burden of obesity and the metabolic syndrome in individuals with psychiatric disorders (McIntyre et al., 2012). Exercise is also a relatively cheap and safe intervention (J Sarris, Kavanagh, & Newton, 2008), and aside from providing marked beneficial effects on neuroendocrine systems, it also increases self-efficacy and self-esteem (via activity scheduling and attainment of goals) which may be important psychological issues among people with mental illness (Deslandes et al., 2009).

Current evidence supports the use of exercise of adequate intensity and duration to improve mood and comorbid medical disorders. Research indicates that a dose-dependent effect occurs, with regular moderate to strong intensity exercise eliciting more positive results (Dunn, Trivedi, Kampert, Clark, & Chambliss, 2005; Singh et al., 2005). Clinical guidelines for exercise recommend physician assessment (or referral to an exercise physiologist) before commencing a new regime, which should consist of moderate to vigorous aerobic exercise (30-60 minutes) in addition to anaerobic weight-

bearing exercises approximately four to six days per week (Khan et al., 2009) (Daley, 2008). However such an approach may be challenging to achieve in dense urban environments in many Asian cities. Further, while exposure to social interaction when exercising may have additionally psychological benefits, different modes of exercise may or may not be appropriate depending on socioeconomic factors, work patterns, cultural practice and available resources. For example, traditional forms of exercise such as Tai Chi may be effective in both improving both physical and mental health (F. Wang et al., 2014).

General Lifestyle and Psycho-Education

There are a range of general lifestyle factors that are modifiable (e.g. alcohol and nicotine use, sleep, and social interactions), and these elements can be educated upon. While psychoeducation may not demonstrate equal effectiveness to interventions such as cognitive behavioural therapy or pharmacological treatments, it is an important psychotherapy component by way of increasing an individual's knowledge and understanding of his/her condition/s, fostering insight, increasing engagement in (and adherence to) treatment, and enhance self-efficacy (Xia, Merinder, & Belgamwar, 2011). For example, Cochrane analyses on the treatment of schizophrenia have demonstrated psychoeducational interventions significantly reduced relapse and readmission rates, enabled fewer hospital days, increased medication adherence, increased satisfaction with mental health services, and improved quality of life (Xia et al., 2011). Psychoeducation can also target a range of ancillary issues, including sleep hygiene and management of substances/vices that may be contributing to and/or perpetuating mental illness and comorbid metabolic problems.

Limiting or avoiding smoking and alcohol is a key component in general lifestyle education. For example, smoking cessation needs to be routinely communicated as part of clinical care, with individuals being offered evidence-based smoking cessation interventions when appropriate (M Berk, 2007). Smoking cigarettes has not only a harmful physical affect, but may also increase the risk for mental health disorders (Choi, Patten, Gillin, Kaplan, & Pierce, 1997; Johnson & Breslau, 2006; Klungsoyr, Nygard, Sorensen, & Sandanger, 2006; Moylan, Jacka, Pasco, & Berk, 2012; L. T. Wu & Anthony, 1999). In both unipolar depression and bipolar disorder, smoking has a negative effect on symptom severity (Jamal, Willem Van der Does, Cuijpers, & Penninx, 2012), and may also interfere with treatment response (M. Berk et al., 2008; Dodd et al.). Alcohol use and dependence is a very common comorbid psychiatric disorder. A meta-analysis of four large-scale epidemiological studies revealed a two- to three fold increased lifetime risk for affective disorders in those with alcohol dependence or abuse (Swendsen et al., 1998). A recent meta-analysis which found that the presence of either an alcohol use disorder or major depressive disorder doubles the risk of the other disorder (Boden & Fergusson, 2012). Both smoking and alcohol use are a prevalent public health concern across Asia, and tackling these issues within a clinical setting should focus on differentiating and managing the problem in a culturally appropriate way using a range of psycho-educational, counselling and pharmacotherapeutic strategies to minimise harm. Another consideration for parts of the region is betel nut use. Although there may be less concern about alcohol and nicotine use according to a previous report in places such as Taiwan (Chang, Sung, Zhu, & Chiou, 2014; Yang, 2002), high betel nut use remains prevalent (Kao & Lim, 2015).

Encouraging recreational activities may also provide an opportunity to experience pleasure, to direct the mind away from rumination and worry, and may provide a setting for increased social interaction. The benefits of participation in organised physical recreation and spending time in nature is currently supported by a limited dataset (Annerstedt & Wahrborg, 2011). Global climate change and environmental degradation affecting many parts of Asia has been a growing public

concern. While current data is weak in respect to an association with mental health issues, minimising exposure to environmental toxins, chemicals pollutants (Genc, Zadeoglulari, Fuss, & Genc, 2012) and noise pollution (Riediker & Koren, 2004), may also be common-sense educational considerations.

Positive social environment, such as supportive and intimate relationships has been established to have a beneficial effect on general health, and in particular for maintaining psychological health (Ibarra-Rovillard & Kuiper, 2011). On the other hand, moderation of excessive technological interface (e.g. mobile phones, computers, television) may be potentially important in general lifestyle education (Walsh, 2011). Many Asian populations have developed an integral utilisation of technology as a primary work and social medium. This coupled with changes in community and family structures (such as living with nuclear families and other forms of social exclusion), may influence mental health.

Mindfulness

Mindfulness techniques have been adapted from Eastern cultures, and are increasingly utilised and in many cases 'rebranded' as mainstream psychological applications. Mindfulness techniques have a potential role in LFPs to be applied to enhance general mental health, regulate emotions, increase concentration, and even aid in modifying eating patterns. Results of a comprehensive meta-analysis examining mindfulness based therapies (MBT) in 209 studies with diverse participants suggests MBT are moderately effective in pre-post comparisons, in comparisons with waitlist controls, and when compared to other active treatments for a range of medical applications (Khoury et al., 2013). Another meta-analysis of 39 studies utilising MBT for a range of conditions, including cancer, generalised anxiety disorder, depression, and other psychiatric, or medical conditions has revealed MBT is moderately effective for improving anxiety and mood symptoms in both clinical and non-clinical samples (Hofmann, Sawyer, Witt, & Oh, 2010). In patients with clinical anxiety and mood disorders, MBT have demonstrated a large effect size for improving clinical symptoms (Hofmann et al., 2010) and have shown large and clinically significant effects in treating anxiety and depression, with gains maintained at follow-up (Khoury et al., 2013).

Overall, results suggest MBT is a promising treatment for a variety of psychological problems, and is especially effective in reducing anxiety, depression, and stress. As mindfulness based techniques originated from Eastern cultures, applying these via an LFP is generally well accepted in the Asian settings. Mindfulness techniques may be applied as a meditative practice, or in simple forms (such as mindful walking or eating and breathing exercises), or as applied psychological techniques such as mindfulness-based CBT, or as movement based approaches such as Tai Chi, Qi gong, or yoga (of which have some evidence in improving mood or reducing anxiety) (Cramer, Lauche, Langhorst, & Dobos, 2013; J. Sarris et al., 2012; Yin & Dishman, 2014).

Goal Setting and Motivational Interviewing

Psychologically-based motivational enhancing component can improve the ability of participants to have regular attendance and to adhere to the structure and application of LFPs. Goal setting techniques, especially those individually-tailored, are widely acknowledged to assist patients with physical and psychological conditions establish realistic antecedent goals and improve motivation (Bloomgarden, 2008). One specific evidence-based approach to improving compliance involves 'motivational interviewing'. For example, a meta-analysis of RCTs (Rubak, Sandbaek, Lauritzen, & Christensen, 2005) has demonstrated motivational interviewing was significantly more effective than traditional advice-giving for initiating changes in weight at follow up between 3 and 24 months (mostly under 6 months). A meta-analysis

of 72 clinical trials has also concluded motivational strategies promote improved adherence to diet and exercise programs (Hetteema, Steele, & Miller, 2005). An additional meta-analysis of RCTs (Burke, Arkowitz, & Menchola, 2003) provided good evidence of the effectiveness of motivational interviewing for combined physical activity and dietary outcomes, up to four months post-intervention. Application of such techniques however may potentially be less needed in Asian populations due to a high adherence rate with participating in such programs (Songprakun & McCann, 2012).

SPECIFIC CROSS-CULTURAL CONSIDERATIONS

There are a range of specific considerations when developing and implementing LFPs across Asian cultures. Importantly, an understanding of the cultural uniqueness and diversity across the region is crucial. Lifestyle, work, family and community interaction patterns have been entrenched for millennia, and thus it is best to work to tailor any program to the specific culture. Due to this, it may be important for such programs to be promoted by local authorities or by workplaces. While some LFPs have been studied in Asia to address general health issues such as diabetes, or smoking, there are few studies evaluating integrative LFPs in Asian populations to address mental health issues. One recent study (n=56) assessed self-help (bibliotherapy) in improving psychological resilience of Thai people with moderate level depression (aged 18-60) (Songprakun & McCann, 2012). Results revealed that the eight modules delivered over an 8-week period focussing on psychoeducation, progressive muscle relaxation, sleep hygiene, physical activity and socialisation, revealed a significant difference (<0.001) in increased perceived resilience between the intervention and control group at follow up.

In Japan, the Ministry of Health, Labour and Welfare has been promoting “Health Japan 21” as health promotion measure targeting general population since 2000, which set goals within the nine areas, namely, nutrition and dietary habits, physical activity, rest and mental health development, tobacco, alcohol, oral health, diabetes, cardiovascular diseases and cancer (The Ministry of Health). The idea of “Health Japan 21” which matches well with the use of a formulised LFP, have promoted “special health check-ups and special health-maintenance guidance” focusing on metabolic syndrome since 2008. A relatively low rate of attending special health-maintenance guidance has occurred, and this may be related to the universal health care system (where people have easy access to doctors as needed) (The Ministry of Health). However the use of integrative LFPs with the application of psychoeducation, mindfulness and motivation techniques may provide more interest and uptake of such programs. Another consideration is that to mitigate work stress and long work hours, some Japanese people may develop the habit of an alcoholic ‘nightcap’. The prevalence of alcohol use as a sleep aid one or more times per week was 48.3% among men and 18.3% among women in Japan which is higher than in other countries (Kaneita et al., 2007). The use of alcohol appears to be a more popular sleep aid than hypnotic medication or consulting doctors (Kaneita et al., 2007; Soldatos, Allaert, Ohta, & Dikeos, 2005). Changing such entrenched habits may be challenging for any public health promotion measures to address.

Further, lifestyle and circumstances have changed in recent years, and appropriate LFPs may be increasingly needed in modern Japan. With increasing patients seeking help for mental disorders, a previous study reported that psychiatrists in Japan saw an average 33 patients per day, length of consultation per patients was 8.3 minutes, and Japanese psychiatrists were more likely to choose pharmacotherapy or active monitoring and less likely to select psychotherapy (Nakagawa et al., 2015). Thus concise evidence-based LFP can be a potentially good option for mild cases of common

mental disorders. In this context, one evident challenge is how to deliver LFPs considering the very brief psychiatry consultation times. The use of LFPs could be delivered via online formats or via other allied health professionals.

In China there are only approximately 20,000 psychiatrists of whom only about 4,000 are fully trained and qualified (Ng et al., 2009) serving a population of 1.4 billion. Therefore most of mental health services in China have been focusing on patients with severe mental illness in hospital and community settings (Xiang, Yu, Sartorius, Ungvari, & Chiu, 2012). In contrast, LFPs addressing mental health are underdeveloped. In recent years, some effective psychosocial and psychoeducational interventions have been introduced from the West and demonstrated to be effective improving outcomes in major depression (Zu et al., 2014), schizophrenia (Li et al., 2015) and substance dependence (S. Pan et al., 2015). Positively, some researchers combined traditional Chinese spiritual activities, such as Daoist, and CBT, which was effective improving mental health (Zhang & Qu, 2011). For example, in one study 68 patients with post-stroke depression were randomly assigned to either Taoist cognitive psychotherapy (TCP) plus fluoxetine (20mg/day) or fluoxetine (20mg/day) alone. At the end of 6-month, compared to the fluoxetine group, the TCP plus fluoxetine group improved significantly in depressive symptoms and functional outcomes (J. P. Wang & Xu, 2005). In addition, LFGs appeared to be effective for antipsychotic-induced weight gain. In a controlled study 128 patients with first-episode schizophrenia on antipsychotic medications were randomly assigned to 12 weeks of placebo, 750 mg/d of metformin alone, 750 mg/d of metformin plus lifestyle intervention, or lifestyle intervention only. Finally, lifestyle intervention plus metformin showed the best effect on weight loss (R. R. Wu et al., 2008).

Lifestyle programs with a focus on mental health started in Singapore fifteen years ago when there were local reports of stress-related mental disorders (Ko, Kua, & Fones, 1999; E. H. Kua, 1998; E. H. Kua, Tian, Lai, & Ko, 1989). The Health Promotion Board from the Ministry of Health introduced short programs in schools and workplaces with stress management courses. Due to the stigma of mental illness, attendance was usually poor and there was reluctance to seek help for those with mental health problems (E. Kua, 2009). There is now a realisation that 'sub-syndromal' depressive or anxiety disorders (e.g. insomnia, low mood, anhedonia and lethargy) can affect people's quality of life and productivity at work (Soh, Rajeev, Niti, Kua, & Ng, 2007). To address such issues among the Chinese population in Singapore, using mindfulness practice and seeking help from the traditional healers is acceptable and lacks the stigma of a psychiatric label (E. Kua & Tan, 2005).

To assess the outcomes and utility of common lifestyle program components in Singapore, a preventive psychiatry program for depression and dementia in Chinese elderly was started in 2013 with the participation of non-governmental organizations (NGOs), private sector and volunteers. The Jurong Ageing Study (JAS) is a project to ascertain whether psycho-social intervention through group activities together with health education about lifestyle, diabetes mellitus and hypertension, can prevent the onset of depression and delay the progression of dementia (D. Wu et al., 2014). The model of psychological therapy used is based on the brief integrative personal therapy or BIPT (Feng, Cao, Zhang, Wee, & Kua, 2011), being combined with differing lifestyle interventions. A cohort of 2000 elderly people living around the research centre will be followed up for 10 years. The first study cohort comprised 110 Chinese elderly with mild depressive or anxiety symptoms, but no DSM-5 mental disorders. This was a naturalistic study and all the elderly attended group meetings once a week for 3 months and then monthly for 21 months. The study tested four individual modalities in four separate groups- art therapy, music-remembrance therapy, tai-chi exercise and mindfulness practice;

finding that each of these resulted in low Zung scores even after one year (Rawtaer et al., 2015). The preliminary results support that a range of lifestyle program components can improve the mood of elderly Chinese people and that the group approach is both acceptable and enjoyable. It would be of interest to see whether an integrative LFP involving all of these components will be effective in those with diagnosed mental disorders.

Dietary habits are changing in Asia due to the increasing availability of Westernised food choices in recent decades (Baker & Friel, 2014). Two national surveys from the 1993-1996 and 2005-2008 Nutrition and Health Surveys in Taiwan (NAHSIT) found a significant increase in sugar intakes and sedentary lifestyle especially in young generation (W. H. Pan et al., 2011). Some positive dietary and behavioral changes were also observed, which could explain the lack of large changes in the prevalence of hypertension and hypercholesterolemia, and the decrease in prevalence of hyperuricemia (W. H. Pan et al., 2011). Both vegetables and fruits, which are consumed commonly in Taiwan, might be protective against depression (Tsai, Chang, & Chi, 2012). Diet therapy (or dietary modification) and traditional Chinese medicine, are also used widely in clinical prevention and therapy for both mental and physical illness in Taiwan, Japan, Korea and China (T. H. Wu et al., 2008). Dietary patterns differ across Asian regions, and while it is important for any modifications to work within cultural diets, general advice to advocate a wholefood unprocessed diet is sensible. Excessive salt/sodium consumption may also be an issue in some countries (Batcagan-Abueg, Lee, Chan, Rebello, & Amarra, 2013), and thus may be a potential point of dietary education.

While many people from modern Asian countries can benefit from LFPs, in some countries this may be challenging to implement due to high workplace demands, long working hours and low leave usage. One particular challenge within this context is the implementation of regular PA and exercise. In some modernised countries such as Taiwan, jogging, basketball, aerobics, and yoga are popular, but the subtropical climate may lead to a preference for indoor exercise and an increase in sports and gym facilities. Being based on ancient Daoist and Buddhist practices, common spiritual practices in Taiwan include Qigong, Tai chi, and various styles of meditation. In line with 'mindfulness' components of LFPs these practices may be considered not only for prevention or therapy for illness, but also for self-growth. Therefore, people may practice these spiritual activities as a 'lifestyle', rather than as therapeutic sessions.

Environmental toxins (including particulate air pollution) are also an issue in many Asian countries; this having a potential effect on the central nervous system (Genc et al., 2012). For example, exposure to air pollution has been found in a longitudinal study of 537 elderly Koreans to be associated with an increase in depressive symptoms (Lim et al., 2012). To mitigate this, benefits may be found in spending time in nature which will result in increased exposure to fresh air and sunlight. This may be manifested as a 'nature-assisted therapy' approach (for example nature hikes) (Annerstedt & Wahrborg, 2011). One interesting application in both Japan (Takayama et al., 2014) and China (Mao et al., 2012), is the recommendation of 'forest bathing', which involves advising people to spend time in forests. Emerging evidence is showing that such experiences can improve both general mental health and physiological stress and immune biomarkers.

CONCLUSION

Both Western, and increasingly Asian populations, are becoming more sedentary and are eating a poorer diet than previous generations, while facing growing environmental degradation. This in combination with aberrant sleep/wake cycle patterns, alcohol and nicotine use, work pressures and psychosocial factors, may exert a cost on both physical and mental health. There is hence a strong argument to enhance the application of LFPs in Asian countries to improve mental and physical health, while encompassing an integrative approach to delivering optimal health care. However, any intervention program needs to be modified for local cultures and consider the impact of lifestyle adjustment, motivational issues, time and financial limitations, and individual and societal perspectives on mental health problems and their treatment priorities. Further research is needed to ascertain the optimal delivery time of integrative LFPs in terms of frequency, duration and intensity of the program that is also balanced with personal and work commitments. Such logistical elements and cultural considerations impacting program design are critical to develop and apply LFPs tailored for Asian cultures.

Acknowledgements

Dr J. Sarris is supported by a CR Roper Fellow at the University of Melbourne

Conflicts of Interest

No authors note any direct conflict of interest

Contribution to Manuscript

All authors contributed content and editing to the manuscript

References

- Annerstedt, M., & Wahrborg, P. (2011). Nature-assisted therapy: systematic review of controlled and observational studies. *Scand J Public Health*, 39(4), 371-388. doi: 10.1177/1403494810396400
- Baker, P., & Friel, S. (2014). Processed foods and the nutrition transition: evidence from Asia. *Obes Rev*, 15(7), 564-577. doi: 10.1111/obr.12174
- Bartels, S., & Desilets, R. *Health Promotion Programs for People with Serious Mental Illness*. Washington D.C.
- Batcagan-Abueg, A. P., Lee, J. J., Chan, P., Rebello, S. A., & Amarra, M. S. (2013). Salt intakes and salt reduction initiatives in Southeast Asia: a review. *Asia Pac J Clin Nutr*, 22(4), 490-504. doi: 10.6133/apjcn.2013.22.4.04
- Berk, M. (2007). Should we be targeting smoking as a routine intervention? *Acta Neuropsychiatrica*, 19(131-132).
- Berk, M., Ng, F., Wang, W. V., Tohen, M., Lubman, D. I., Vieta, E., & Dodd, S. (2008). Going up in smoke: tobacco smoking is associated with worse treatment outcomes in mania. *J Affect Disord*, 110(1-2), 126-134.
- Bloomgarden, Z. T. (2008). American College of Endocrinology Pre-Diabetes Consensus Conference: Part One. *Diabetes Care*, 31, 2062-2069.
- Boden, J. M., & Fergusson, D. M. (2012). Alcohol and depression. *Addiction*, 106(5), 906-914.

- Burke, B. L., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. *J Consult Clin Psychol*, *71*(5), 843-861. doi: 10.1037/0022-006X.71.5.843
- Chang, F. C., Sung, H. Y., Zhu, S. H., & Chiou, S. T. (2014). Impact of the 2009 Taiwan tobacco hazards prevention act on smoking cessation. *Addiction*, *109*(1), 140-146. doi: 10.1111/add.12344
- Choi, W. S., Patten, C. A., Gillin, J. C., Kaplan, R. M., & Pierce, J. P. (1997). Cigarette smoking predicts development of depressive symptoms among U.S. adolescents. *Ann Behav Med*, *19*(1), 42-50.
- Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2013). Yoga for Depression: A Systematic Review and Meta-Analysis. *Depress Anxiety*. doi: 10.1002/da.22166
- Daley, A. (2008). Exercise and depression: a review of reviews. *J Clin Psychol Med Settings*, *15*(2), 140-147. doi: 10.1007/s10880-008-9105-z [doi]
- Deslandes, A., Moraes, H., Ferreira, C., Veiga, H., Silveira, H., Mouta, R., . . . Laks, J. (2009). Exercise and mental health: many reasons to move. *Neuropsychobiology*, *59*(4), 191-198. doi: 000223730 [pii]
10.1159/000223730 [doi]
- Dodd, S., Brnabic, A. J., Berk, L., Fitzgerald, P. B., de Castella, A. R., Filia, S., . . . Berk, M. (2010). A prospective study of the impact of smoking on outcomes in bipolar and schizoaffective disorder. *Compr Psychiatry*, *51*(5), 504-509.
- Dunn, A. L., Trivedi, M. H., Kampert, J. B., Clark, C. G., & Chambliss, H. O. (2005). Exercise treatment for depression: efficacy and dose response. *American Journal Of Preventive Medicine*, *28*(1), 1-8.
- Feng, L., Cao, Y., Zhang, Y., Wee, S., & Kua, E. (2011). Psychological therapy with Chinese patients. *Asian Journal of Psychiatry*, *3*(167-172).
- Foster, G. D., Makris, A. P., & Bailer, B. A. (2005). Behavioral treatment of obesity. *Am J Clin Nutr*, *82*(1 Suppl), 230S-235S.
- Franz, M. J., VanWormer, J. J., Crain, A. L., Boucher, J. L., Histon, T., Caplan, W., . . . Pronk, N. P. (2007). Weight-loss outcomes: a systematic review and meta-analysis of weight-loss clinical trials with a minimum 1-year follow-up. *J Am Diet Assoc*, *107*(10), 1755-1767. doi: 10.1016/j.jada.2007.07.017
- Garcia-Toro, M., Ibarra, O., Gili, M., Serrano, M. J., Oliván, B., Vicens, E., & Roca, M. (2012). Four hygienic-dietary recommendations as add-on treatment in depression: a randomized-controlled trial. *J Affect Disord*, *140*(2), 200-203. doi: 10.1016/j.jad.2012.03.031
- Genc, S., Zadeoglulari, Z., Fuss, S. H., & Genc, K. (2012). The adverse effects of air pollution on the nervous system. *J Toxicol*, *2012*, 782462. doi: 10.1155/2012/782462
- Hettema, J., Steele, J., & Miller, W. R. (2005). Motivational interviewing. *Annu Rev Clin Psychol*, *1*, 91-111. doi: 10.1146/annurev.clinpsy.1.102803.143833
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *J Consult Clin Psychol*, *78*(2), 169-183. doi: 10.1037/a0018555
- Howes, M. J., & Perry, E. (2011). The role of phytochemicals in the treatment and prevention of dementia. *Drugs Aging*, *28*(6), 439-468. doi: 2 [pii]
10.2165/11591310-000000000-00000 [doi]
- Ibarra-Rovillard, M. S., & Kuiper, N. A. (2011). Social support and social negativity findings in depression: perceived responsiveness to basic psychological needs. *Clin Psychol Rev*, *31*(3), 342-352. doi: 10.1016/j.cpr.2011.01.005
- Jacka, F. N., & Berk, M. (2007). Food for Thought. *Acta Neuropsychiatrica*, *19*(5), 321-323.
- Jamal, M., Willem Van der Does, A. J., Cuijpers, P., & Penninx, B. W. (2012). Association of smoking and nicotine dependence with severity and course of symptoms in patients with depressive or anxiety disorder. *Drug Alcohol Depend*.

- Johnson, E. O., & Breslau, N. (2006). Is the association of smoking and depression a recent phenomenon? *Nicotine Tob Res*, *8*(2), 257-262.
- Kaneita, Y., Uchiyama, M., Takemura, S., Yokoyama, E., Miyake, T., Harano, S., . . . Ohida, T. (2007). Use of alcohol and hypnotic medication as aids to sleep among the Japanese general population. *Sleep medicine*, *8*(7-8), 723-732. doi: 10.1016/j.sleep.2006.10.009
- Kao, S. Y., & Lim, E. (2015). An overview of detection and screening of oral cancer in Taiwan. *Chin J Dent Res*, *18*(1), 7-12.
- Khan, N. A., Hemmelgarn, B., Herman, R. J., Bell, C. M., Mahon, J. L., Leiter, L. A., . . . Tobe, S. (2009). The 2009 Canadian Hypertension Education Program recommendations for the management of hypertension: Part 2--therapy. *Can J Cardiol*, *25*(5), 287-298.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., . . . Hofmann, S. G. (2013). Mindfulness-based therapy: a comprehensive meta-analysis. *Clin Psychol Rev*, *33*(6), 763-771. doi: 10.1016/j.cpr.2013.05.005
- Klungsoyr, O., Nygard, J. F., Sorensen, T., & Sandanger, I. (2006). Cigarette smoking and incidence of first depressive episode: an 11-year, population-based follow-up study. *Am J Epidemiol*, *163*(5), 421-432.
- Knapen, J., Vancampfort, D., Morien, Y., & Marchal, Y. (2014). Exercise therapy improves both mental and physical health in patients with major depression. *Disabil Rehabil*, 1-6. doi: 10.3109/09638288.2014.972579
- Ko, S. M., Kua, E. H., & Fones, C. S. (1999). Stress and the undergraduates. *Singapore Med J*, *40*(10), 627-630.
- Kua, E. (2009). *Speaking up for mental health*. Singapore: Armour Publishing.
- Kua, E., & Tan, C. (2005). Traditional Chinese medicine in psychiatric practice. *8*, 7-9.
- Kua, E. H. (1998). Doctor under stress. *Singapore Med J*, *39*(11), 478.
- Kua, E. H., Tian, C. S., Lai, L., & Ko, S. M. (1989). Work stress and mental distress. *Singapore Med J*, *30*(4), 343-345.
- Li, Z. J., Guo, Z. H., Wang, N., Xu, Z. Y., Qu, Y., Wang, X. Q., . . . Kingdon, D. (2015). Cognitive-behavioural therapy for patients with schizophrenia: a multicentre randomized controlled trial in Beijing, China. *Psychological Medicine*, *45*(9), 1893-1905. doi: 10.1017/S0033291714002992
- Lim, Y. H., Kim, H., Kim, J. H., Bae, S., Park, H. Y., & Hong, Y. C. (2012). Air pollution and symptoms of depression in elderly adults. *Environ Health Perspect*, *120*(7), 1023-1028. doi: 10.1289/ehp.1104100
- Mao, G. X., Lan, X. G., Cao, Y. B., Chen, Z. M., He, Z. H., Lv, Y. D., . . . Yan, J. (2012). Effects of short-term forest bathing on human health in a broad-leaved evergreen forest in Zhejiang Province, China. *Biomed Environ Sci*, *25*(3), 317-324. doi: 10.3967/0895-3988.2012.03.010
- McElroy, S. L. (2009). Obesity in patients with severe mental illness: overview and management. *J Clin Psychiatry*, *70* Suppl 3, 12-21. doi: 10.4088/JCP.7075su1c.03
- McIntyre, R. S., Alsuwaidan, M., Goldstein, B. I., Taylor, V. H., Schaffer, A., Beaulieu, S., & Kemp, D. E. (2012). The Canadian Network for Mood and Anxiety Treatments (CANMAT) task force recommendations for the management of patients with mood disorders and comorbid metabolic disorders. *Ann Clin Psychiatry*, *24*(1), 69-81.
- McMillan, L., Owen, L., Kras, M., & Scholey, A. (2010). Behavioural effects of a 10-day Mediterranean diet. Results from a pilot study evaluating mood and cognitive performance. *Appetite*. doi: S0195-6663(10)00696-3 [pii] 10.1016/j.appet.2010.11.149
- Moylan, S., Jacka, F., Pasco, J., & Berk, M. (2012). Cigarette smoking, nicotine dependence and anxiety disorders: a systematic review of population-based, epidemiological studies. *BMC Med*, *10*(123).
- Nakagawa, A., Williams, A., Sado, M., Oguchi, Y., Mischoulon, D., Smith, F., . . . Sato, Y. (2015). Comparison of treatment selections by Japanese and US psychiatrists for major depressive disorder: A case vignette study. *Psychiatry Clin Neurosci*. doi: 10.1111/pcn.12273

- Ng, C. H., Ma, H., Yu, X., Chiu, H., Fraser, J., Chan, S., . . . Jia, F. J. (2009). China-Australia-Hong Kong tripartite community mental health training program. *Asia-Pacific Psychiatry, 1*, 90-97.
- Pan, S., Jiang, H., Du, J., Chen, H., Li, Z., Ling, W., & Zhao, M. (2015). Efficacy of Cognitive Behavioral Therapy on Opiate Use and Retention in Methadone Maintenance Treatment in China: A Randomised Trial. *PLoS One, 10*(6), e0127598. doi: 10.1371/journal.pone.0127598
- Pan, W. H., Wu, H. J., Yeh, C. J., Chuang, S. Y., Chang, H. Y., Yeh, N. H., & Hsieh, Y. T. (2011). Diet and health trends in Taiwan: comparison of two nutrition and health surveys from 1993-1996 and 2005-2008. *Asia Pac J Clin Nutr, 20*(2), 238-250.
- Quirk, S. E., Williams, L. J., O'Neil, A., Pasco, J. A., Jacka, F. N., Housden, S., . . . Brennan, S. L. (2013). The association between diet quality, dietary patterns and depression in adults: a systematic review. *BMC Psychiatry, 13*, 175. doi: 10.1186/1471-244X-13-175
- Rawtaer, I., Mahendran, R., Yu, J., Fam, J., Feng, L., & Kua, E. (2015). Art, music, tai-chi and mindfulness: An evaluation of psychosocial interventions for subsyndromal depression and anxiety in older adults - a naturalistic study. *Asia-Pacific Psychiatry, In Press*.
- Riediker, M., & Koren, H. S. (2004). The importance of environmental exposures to physical, mental and social well-being. *Int J Hyg Environ Health, 207*(3), 193-201.
- Rimer, J., Dwan, K., Lawlor, D. A., Greig, C. A., McMurdo, M., Morley, W., & Mead, G. E. (2012). Exercise for depression. *Cochrane Database Syst Rev, 7*, CD004366. doi: 10.1002/14651858.CD004366.pub5
- Ross, J. A., & Kasum, C. M. (2002). Dietary flavonoids: bioavailability, metabolic effects, and safety. *Annu Rev Nutr, 22*, 19-34.
- Rubak, S., Sandbaek, A., Lauritzen, T., & Christensen, B. (2005). Motivational interviewing: a systematic review and meta-analysis. *Br J Gen Pract, 55*(513), 305-312.
- Sarris, J. (2014). Anxiety. In J. Sarris & J. Wardle (Eds.), *Clinical Naturopathy: an evidence-based guide to practice*. Sydney: Elsevier, Edition 2.
- Sarris, J., Kavanagh, D., & Newton, R. (2008). Depression and Exercise. *Journal of Complementary Medicine, May/June*(3), 48-50,61.
- Sarris, J., Moylan, S., Camfield, D. A., Pase, M. P., Mischoulon, D., Berk, M., . . . Schweitzer, I. (2012). Complementary medicine, exercise, meditation, diet, and lifestyle modification for anxiety disorders: a review of current evidence. *Evid Based Complement Alternat Med, 2012*, 809653. doi: 10.1155/2012/809653
- Schaar, B., Moose-Thiele, C., & Platen, P. (2010). Effects of exercise, diet, and a combination of exercise and diet in overweight and obese adults - a meta-analysis of the data. *Open Sports Med J, 4*, 17-28.
- Singh, N. A., Stravinos, T. M., Scarbek, Y., Galambos, G., Liber, C., & Singh, M. A. F. (2005). A randomized controlled trial of high versus low intensity weight training versus general practitioner care for clinical depression in older adults. *Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 60A*(6), 768-776.
- Soh, K., Rajeev, K., Niti, M., Kua, E., & Ng, T. (2007). Subsyndromal depression in old age: clinical significance and impact in a multi-ethnic community sample of elderly Singaporeans. *International Psychogeriatrics, 22*, 1087-1094.
- Soldatos, C. R., Allaert, F. A., Ohta, T., & Dikeos, D. G. (2005). How do individuals sleep around the world? Results from a single-day survey in ten countries. *Sleep medicine, 6*(1), 5-13. doi: 10.1016/j.sleep.2004.10.006
- Songprakun, W., & McCann, T. V. (2012). Effectiveness of a self-help manual on the promotion of resilience in individuals with depression in Thailand: a randomised controlled trial. *BMC Psychiatry, 12*, 12. doi: 10.1186/1471-244X-12-12
- Stanley, S., & Laugharne, J. (2014). The Impact of Lifestyle Factors on the Physical Health of People with a Mental Illness: a Brief Review. *International Journal of Behavioral Medicine, 21*(2), 275-281.

- Swendsen, J. D., Merikangas, K. R., Canino, G. J., Kessler, R. C., Rubio-Stipec, M., & Angst, J. (1998). The comorbidity of alcoholism with anxiety and depressive disorders in four geographic communities. *Compr Psychiatry*, 39(4), 176-184.
- Takayama, N., Korpela, K., Lee, J., Morikawa, T., Tsunetsugu, Y., Park, B. J., . . . Kagawa, T. (2014). Emotional, restorative and vitalizing effects of forest and urban environments at four sites in Japan. *Int J Environ Res Public Health*, 11(7), 7207-7230. doi: 10.3390/ijerph110707207
- The Ministry of Health, L. a. W. Data about special health checkups and special health-maintenance guidance (in Japanese). from <http://www.mhlw.go.jp/bunya/shakaihoshoh/iryouseido01/info02a-2.html>
- The Ministry of Health, L. a. W. Health Japan 21 (the second term). from http://www.mhlw.go.jp/seisakunitsuite/bunya/kenkou_iryoh/kenkou/kenkounippon21/en/kenkouunippon21/
- Tsai, A. C., Chang, T. L., & Chi, S. H. (2012). Frequent consumption of vegetables predicts lower risk of depression in older Taiwanese - results of a prospective population-based study. *Public Health Nutr*, 15(6), 1087-1092. doi: 10.1017/S1368980011002977
- Walsh, R. (2011). Lifestyle and Mental Health. *American Psychologist*.
- Wang, F., Lee, E. K., Wu, T., Benson, H., Fricchione, G., Wang, W., & Yeung, A. S. (2014). The effects of tai chi on depression, anxiety, and psychological well-being: a systematic review and meta-analysis. *Int J Behav Med*, 21(4), 605-617. doi: 10.1007/s12529-013-9351-9
- Wang, J. P., & Xu, J. (2005). Effects of Taoist cognitive psychotherapy in the treatment of post-stroke depression (in Chinese). *Chinese Journal of Behavioral Medical Sciences*, 14, 490-491
- Wu, D., Feng, L., Yao, S., Tian, X., Mahendran, R., & Kua, E., 1: 9-11. (2014). The early dementia prevention programme in Singapore. *The Lancet Psychiatry*, 1(9-11).
- Wu, L. T., & Anthony, J. C. (1999). Tobacco smoking and depressed mood in late childhood and early adolescence. *Am J Public Health*, 89(12), 1837-1840.
- Wu, R. R., Zhao, J. P., Jin, H., Shao, P., Fang, M. S., Guo, X. F., . . . Li, L. H. (2008). Lifestyle intervention and metformin for treatment of antipsychotic-induced weight gain: a randomized controlled trial. *JAMA*, 299(2), 185-193. doi: 10.1001/jama.2007.56-b
- Wu, T., Gao, X., Chen, M., & van Dam, R. M. (2009). Long-term effectiveness of diet-plus-exercise interventions vs. diet-only interventions for weight loss: a meta-analysis. *Obes Rev*, 10(3), 313-323. doi: 10.1111/j.1467-789X.2008.00547.x
- Wu, T. H., Chiu, T. Y., Tsai, J. S., Chen, C. Y., Chen, L. C., & Yang, L. L. (2008). Effectiveness of Taiwanese traditional herbal diet for pain management in terminal cancer patients. *Asia Pac J Clin Nutr*, 17(1), 17-22.
- Xia, J., Merinder, L. B., & Belgamwar, M. R. (2011). Psychoeducation for schizophrenia. *Cochrane Database Syst Rev*(6), CD002831. doi: 10.1002/14651858.CD002831.pub2
- Xiang, Y. T., Yu, X., Sartorius, N., Ungvari, G. S., & Chiu, H. F. (2012). Mental health in China: challenges and progress. *Lancet*, 380(9855), 1715-1716. doi: 10.1016/S0140-6736(11)60893-3
- Yang, M. J. (2002). The Chinese drinking problem: a review of the literature and its implication in a cross-cultural study. *Kaohsiung J Med Sci*, 18(11), 543-550.
- Yin, J., & Dishman, R. (2014). The effect of Tai Chi and Qigong practice on depression and anxiety symptoms: A systematic review and meta-regression analysis of randomized controlled trials. *Mental Health and Physical Activity*, 7, 135-146.
- Zhang, G. F., & Qu, Z. X. (2011). The influence of Chinese Taoist cognitive psychotherapy on mental health of first-year college students (in Chinese). *Journal of Henan Institute of Science and Technology*, 9, 106-109.
- Zu, S., Xiang, Y. T., Liu, J., Zhang, L., Wang, G., Ma, X., . . . Li, Z. J. (2014). A comparison of cognitive-behavioral therapy, antidepressants, their combination and standard treatment for Chinese patients with moderate-severe major depressive disorders. *Journal of Affective Disorders*, 152-154, 262-267. doi: 10.1016/j.jad.2013.09.022