

gyrus, insula, orbitofrontal, and anterior cingulate cortices and thalamus. TP is from one of the ancient Tamil texts referring to the benefits of breathing exercise, Thirumanthiram (Rajasekaran and Narayana, 2006; Thirumoolar, Himalayan Academy Publications, Hawaii, USA). Yogic breathing increases vagal tone, increases parasympathetic dominance, decreases sympathetic discharges, and produces theta waves in brain (Jerath *et al.*, 2006). This is the first time the molecular expression of a neurotrophic factor NGF is reported in response to chanting Om and TP. How could the salivary NGF be transported to the CNS? We hypothesize that, the NGF produced by the salivary glands is taken up by (1) the innervating sensory and motor neurons of the oral organs for retrograde axonal transport to the cell body and transcytosis to reach the central neurons, and (2) the sublingual absorption route into the bloodstream to reach other distal target organs. These mechanisms are well within the theoretical framework of production and transport mechanisms established for neuromodulators. It is to be emphasized here that this pilot study is the first ever attempt to stimulate endogenous NGF expression by non-invasive methods. Our findings could lead to future studies on using salivary neuromodulators and biomarkers as outcome measures of Yoga interventions.

Conflict of interest

None.

Supplementary material

To view supplementary material for this article, please visit <http://dx.doi.org/10.1017/S1041610214001616>

doi:10.1017/S1041610214001318

Successfully aging predicts successful aging in successful agers: further definitional issues

I read with great interest Cheng's guest editorial "Defining successful aging: the need to distinguish pathways from outcomes." The landscape of successful aging literature is littered with pathway – and outcome-oriented conceptualizations, making this differentiation an important issue to address. Further to the notion highlighted by Cheng is the usage (and confounding) of items surrounding successful aging. A recent review of the operational definitions of successful aging highlights

References

- Aloe, L., Rocco, M. L., Bianchi, P. and Manni, L. (2012). Nerve growth factor: from the early discoveries to the potential clinical use. *Journal of Translational Medicine*, 10, 239.
- Jerath, R., Edry, J. W., Barnes, V. A. and Jerath, V. (2006). Physiology of long pranayamic breathing: neural respiratory elements may provide a mechanism that explains how slow deep breathing shifts the autonomic nervous system. *Medical Hypotheses*, 67, 566–571.
- Kumar, S., Nagendra, H., Manjunath, N., Naveen, K. and Telles, S. (2010). Meditation on OM: relevance from ancient texts and contemporary science. *International Journal of Yoga*, 3, 2–5.
- Rajasekaran, R. and Narayana, A. (2006). Thirumular – pioneer of the immunology concept. *Bulletin of the Indian Institute of History of Medicine, Hyderabad*, 36, 129–144.
- Thirumoolar, Tirumanthiram. *English Translation of Tamil Spiritual Classic by Saint Thirumular*. Kapa'a, HI: Himalayan Academy Publications.

SUNDARAVADIVEL BALASUBRAMANIAN,¹
JACOBO E. MINTZER²
AND AMY E. WAHLQUIST³

¹Department of Medicine, Cardiology Division,
Presently at Department of Radiation Oncology,
Medical University of South Carolina, Charleston,
South Carolina, USA
Email: balasubr@musc.edu

²Department of Health Studies, Medical University of
South Carolina & Clinical Biotechnology Research
Institute, Roper St. Francis Health Care, Charleston,
South Carolina, USA

³Department of Public Health Sciences, Medical
University of South Carolina, Charleston, South
Carolina, USA

the continued heterogeneity of successful aging operationalizations, identifying over 100 unique definitions of successful aging (Cosco *et al.*, 2014). Perhaps as a by-product of this pervasive definitional heterogeneity, there is an equally pervasive conceptual overlap of the constituent components of successful aging. Depending on the definition of successful aging used (and possibly the availability of variables in a dataset and theoretical background of the researcher), the same item may be used as a predictor, component, or outcome of successful aging. While Cheng (rightfully) advocates for the inclusion of psychosocial components into definitions of successful aging, these items are particularly prone to this conceptual

confusion. Take, for example, an item specifically identified by Cheng: life satisfaction. Successful aging was originally posited as inextricably linked to life satisfaction; however, subsequently, life satisfaction has been identified as a predictor (Roos and Havens, 1991), indicator (Leonard, 1981), and component (Pruchno *et al.*, 2010) of successful aging. Further, several qualitative studies have been conducted with laypersons specifically differentiating between successful aging and life satisfaction, e.g. Fisher (1995). As Cheng illuminates and these examples highlight, the language of successful aging is rife with conceptual confusion – an inhibitive force in the advancement of the field – that must be addressed.

While it may be unrealistic to expect the development of a single, universally accepted operationalization of successful ageing, it is important to acknowledge the diversity of successful aging conceptualizations, e.g. from culturally and geographically diverse sources, and to look toward the practical utility of successful aging models. In order for models of successful aging to demonstrate real world applicability, it is imperative that these theoretical constructs are investigated in practical settings, e.g. longitudinal population-based cohort studies, and their associations with public health outcomes, e.g. health service utilization, are examined. The successful aging paradigm will be greatly strengthened through the application of well-informed conceptualizations of successful aging that have been validated in real-world contexts.

doi:10.1017/S1041610214001288

Antipsychotics for behavioral and psychiatric symptoms of dementia: a reaudit in a specialist inpatient service

The use of antipsychotics for the management of behavioral and psychiatric symptoms of dementia (BPSD) remains highly controversial. These drugs are well known to be associated with increased mortality from cerebrovascular events, as well as with falls, cognitive impairment, and other serious side effects. In 2009, a UK target was set to reduce their use in dementia patients by two-thirds over a three-year period (Banerjee, 2009).

In an earlier publication, we reported on the prescribing of antipsychotics to a group of dementia patients in a specialist inpatient service carried out in 2007 (Haw *et al.*, 2008). The audit was conducted at St Andrew's, Northampton, UK, a charitable foundation which acts as a tertiary referral center. Within the hospital, there is an

Conflict of interest

None.

References

- Cosco, T. D., Prina, A. M., Perales, J., Stephan, B. C. and Brayne, C. (2014). Operational definitions of successful aging: a systematic review. *International Psychogeriatrics*, 26, 373–381.
- Fisher, B. J. (1995). Successful aging, life satisfaction, and generativity in later life. *International Journal Aging and Human Development*, 41, 239–250.
- Leonard, W. M., 2nd (1981). Successful aging: an elaboration of social and psychological factors. *International Journal Aging and Human Development*, 14, 223–232.
- Pruchno, R. A., Wilson-Genderson, M. and Cartwright, F. (2010). A two-factor model of successful aging. *Journals of Gerontology: Series B Psychological Sciences and Social Sciences*, 65, 671–679.
- Roos, N. P. and Havens, B. (1991). Predictors of successful aging: a twelve-year study of Manitoba elderly. *American Journal of Public Health*, 81, 63–68.

THEODORE D COSCO

Cambridge Institute of Public Health, Department of Public Health and Primary Care, University of Cambridge, Cambridge, UK
Email: tdc33@cam.ac.uk

inpatient service for older adults with dementia and challenging behavior and those requiring secure psychiatric care. There is also a unit for patients with Huntington's disease. Although prescribing standards (derived from the National Institute for Health and Clinical Excellence (NICE) dementia guideline (National Collaborating Centre for Mental Health, 2007) and Royal College of Psychiatrists prescribing update (Royal College of Psychiatrists, 2005) were generally satisfactory, some aspects showed room for improvement. We therefore decided to repeat the audit to see if antipsychotic usage for managing BPSD had declined and to see if prescribing standards had improved compared with 2007.

The reaudit was carried out in June and July 2012 and once again involved a cross-sectional survey of inpatients with BPSD on four wards for older adults and one ward for patients with Huntington's disease. We scrutinized medication charts and case notes and questioned the treating psychiatrist using a three-page, 40-item structured proforma taking approximately 45 min to complete per patient,