NLP for Japanese Workers' Mental Well-Being: Pilot Study

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Yasuhiro Kotera
University of Derby
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David Sheffield
University of Derby
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Abstract

Purpose: Although numerous national and organisational level approaches have taken to improve their mental health, Japanese workers still suffer from high rates of mental health problems. Despite its worldwide application, neuro-linguistic programming (NLP) has not been evaluated for these problems in-depth. The purpose of this pilot study is to examine the effects of NLP training for mental health among Japanese workers.

Design/methodology/approach: A pre-post test design with repeated measurements was used with 30 Japanese workers, who were undertaking NLP Practitioner Certification training. The effects on mental health were assessed with the Depression, Anxiety and Stress Scale-21 (DASS-21) and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) at pre-training, post-training, and a three-month follow-up.

Findings: The mean scores of depression and stress decreased significantly, and mental well-being increased significantly between pre-training and post-training and between pre-training and follow-up. There was no significant difference between post-training and the follow-up for any of the measures.

Practical implications: The results suggest this training was effective for mental health of Japanese workers, and the positive effects on mental well-being were sustained.

Originality/Value: This is the first ever study to empirically evaluate the effects of the regulated NLP training on the mental health of Japanese workers, conducted by researchers well-versed in NLP. This training might be conducive to improving the mental health of the Japanese workforce. Larger scale and/or controlled studies are needed.

Keywords: neuro-linguistic programming; NLP training; mental health; mental well-being; Japanese workers

Research paper

Introduction

Japan has suffered from mental health problems for years. Despite its steady population, the number of depressed patients has been increasing; 441,000 in 1999 and 1,041,000 in 2008 - an increase of 136% in these ten years (Ministry of Health, Labour and Welfare [MHLW], 2015). Japan has one of the highest rates of suicide among developed countries (Organisation for Economic Co-operation and Development, 2015). Approximately 30% of these people were employed, and half of these suicide cases were work-related (National Police Agency, 2016). Among Japanese workforce, 60% experienced intense anxiety and stress, and the number of compensation claims for mental health problems in Japanese organisations increased more than seven times (200 in 2000 to 1,500 in 2015; MHLW, 2016). The Japanese government has enacted several new policies in the past two decades to reduce workers' mental health problems. The first extensive initiative was established in 2002 focusing on thorough occupational health consultations and medical examinations (Iwasaki et al., 2006). In 2014, the government passed a new act focusing on prevention of *karoshi* (i.e., death from overwork; Kopp, 2017), requiring more transparency of workers' health (MHLW, 2014). More recently the work-style reform has been passed, aiming to reduce overtime working, a leading cause for Japanese workers' health problems (Prime Minister of Japan and His Cabinet, 2016). Accordingly, more companies have implemented mental health support (23.5% in 2002 and 47.2% in 2012), such as training for managers and more support for employees who have returned from mental health leave (MHLW, 2013). Despite these attempts, however, notable improvements in Japanese workers' health have not been observed (MHLW, 2016). Over half of the companies still do not provide mental health support, because the effects of the implementation of mental health support have been ambiguous. Many (64%) companies did not observe pronounced changes after implementation

(MHLW, 2012). Many Japanese organisations are stuck in the purgatory of poor mental health: mental health support is still not well-implemented in Japanese companies, and even among the companies that have implemented the support, the effects are not promising. Economically, if Japan was able to eradicate mental health problems, the yearly benefit would be 2.7 trillion yen - 0.7% of GDP (Kaneko and Sato, 2010). Therefore, it would be highly beneficial to investigate methods to improve the mental health of Japanese workers.

In order to address this significant mental health problem, recent research has explored the effects of several mental health interventions for Japanese workers. For example, a randomised control trial (RCT) evaluating computerised cognitive behavioural therapy was effective in preventing depressive episodes in 381 IT company employees (Imamura et al., 2015). Stress management training provided to Japanese steel company workers reduced their psychological distress significantly (Umanodan et al., 2009). A two-year longitudinal study evaluated the mental health effects of an employee assistance programme (EAP) at an IT company, and the EAP group's depression reduced significantly (Nakao et al., 2007). A two-hour mental health first aid training increased confidence and practical skills in managing people with mental health problems, and reduced mental health stigma (Kubo et al., 2018). Likewise, other interventions such as mindfulness, acceptance and commitment therapy, and compassion-based approaches were recommended to support mental well-being of Japanese workers (though these interventions have not been explored empirically in-depth) (Iizuka, 2016; Tsuchiya et al., 2017). Taken together, these studies suggest that psychological interventions may be beneficial to Japanese workers.

Complementary interventions to improve Japanese workers' mental health have been also explored. A 12-week lifestyle modification program, which consisted of aerobic exercise and

diet counselling, improved 351 workers' mental health (Ohta et al., 2006). A brief home-based

yoga programme (7.5 minutes per day over two weeks) reduced anxiety and dysphoria in 67

childcare workers (Sakuma et al, 2012). While the active practice of NLP in a workplace has

been reported (Tosey et al., 2005; Yemm, 2006), the effects of neuro-linguistic programming

(NLP) training on mental health of Japanese workers, however, have not been explored to date.

NLP

Although there have been different definitions (de Rijk, 2019), NLP is commonly

regarded as a methodology to model human experience (Bandler and Grinder, 1979), by

considering how outstanding results are created (O'Connor and McDermott, 2001). NLP has its

origins in observations that Richard Bandler made about specific linguistic structures that

excellent psychotherapists used to increase the effects of positive suggestions for patients

(Bandler and Grinder, 1979). Bandler and Grinder identified common patterns used by these

psychotherapists and developed NLP (Bandler and Grinder, 1979). Because of its applicability,

NLP has been used for a variety of mental health problems including depression, anxiety, and

stress (Bigley et al., 2010; Churches and West-Burnham, 2008; Gray, 2002, 2010; Gray and

Liotta, 2012; Juhnke et al., 2008; Muss, 1991; Simpson and Dryden, 2011; Stipancic et al., 2010;

Wake, 2008, 2011; Wake and Leighton, 2014; Weaver, 2009; Witt, 2003, 2008) and has been

used in a wide range of fields worldwide e.g., sports, education, and business (Zastrow et al.,

1987; Tosey et al., 2005; Karunaratne, 2010). In the UK, over 100,000 participants have attended

NLP training courses (Tosey and Mathison, 2007). Sturt et al. (2012) emphasised NLP's

significance in the National Health Services (NHS): 326 NHS organisations spent more than

£800,000 on NLP-related training, where more than 700 staff undertook the training over three

years (2006-2009). The trend is similar in Japan: the NLP Connection, one of the original NLP organisations, has certified 1,725 practitioners, 1,321 master practitioners, 373 trainer associates, and 40 trainers (C. Hall, personal communication, March 15, 2016), illustrating the growing popularity of NLP in Japan.

Despite its wide applications, the science of NLP has been criticised for being underdeveloped (Dowlen, 1996; Thompson et al., 2002; Wake, 2011; Sturt et al., 2012; Pensieri, 2013; Pishghadam and Shayesteh, 2014; Kotera et al., 2019). The few studies that have evaluated the effects of NLP training have focused on mental health (Sahebalzamani, 2014), self-efficacy and problem solving (Zamini et al., 2009), and communication skills (Gunenç et al., 2015). For example, Sahebalzamani (2014) examined the effects of NLP training, which consisted of five 120-minute sessions, on mental health. There were significant increases on the mental health measures from pre-training to post-training. Moreover, while a qualitative appraisal has been conducted (Kotera and Van Gordon, 2019), to date, no studies have quantitatively explored the effects of NLP certification training on Japanese workers.

Further evidence of the limited quantity and quality of research of NLP is found in a number of literature reviews. Witkowski (2010) explored articles on NLP Research Data Base (Hücker, 1995), which stored more than 300 NLP articles. Thirty-three empirical articles were chosen for close examination: nine were supportive of NLP; 18 were non-supportive of NLP; and six reported uncertain outcomes. Based on these studies he concluded NLP was ineffective. However, this conclusion has several flaws: most of the 18 non-supportive articles examined on one aspect of NLP, the preferred representational system (PRS; Adler, 2002), which was examined independently of and, isolated from the NLP model (e.g. Elich et al., 1985; Graunke and Roberts, 1985). As Pensieri (2013) and others (Einspruch and Forman 1985; Robbins, 1995;

Dilts, 1983) have emphasised, NLP skills should be examined within the whole NLP framework. In the remainder of the non-supportive studies the interventions were delivered by researchers who were not trained in NLP. In general, the studies were of poor quality. Thus, NLP skills should be examined in their framework using appropriately qualified and trained practitioners and using appropriate evaluative rigour.

Sturt et al. (2012) systematically reviewed NLP interventions on health outcomes. They selected NLP studies reporting primary research on health-related outcomes. Ten studies were included: five were RCTs, and the other five were pre-post test studies. Six studies described the qualifications of the interventionists, who were either NLP practitioners or NLP master practitioners. They concluded that much of the limited research was weak and underreported. Accordingly, NLP studies need to report study methodological details (e.g. aims, outcomes, participants, interventions) clearly. Pensieri's literature review (2013) focused on 61 academic articles that examined the effects of NLP retrieved on PubMed. Pensieri suggested that there were several problems about NLP research, which were focused on researchers' lack of understanding NLP. For example, numerous NLP studies examined an NLP skill independently, isolated from the NLP model. This could compromise the effects of the skill, as many of NLP skills need to be used in the whole framework (Robbins, 1995; Dilts, 1983). Also many of the researchers may have ignored subtle NLP skills, such as the meta-model, that are arguably fundamental to NLP (Bandler and Grinder, 1979). Thus, this review also highlights the importance of employing researchers who are well-trained in NLP, so that NLP skills will be examined appropriately. More recently, Kotera et al. (2019) systematically reviewed reports exploring the work psychological effects of NLP training on employees. Of 952 retrieved articles, seven were closely examined. While the promising diverse effects of NLP training were

noted (measured against a variety of psychological outcomes); again, research rigour was deemed poor.

While the practice of NLP has been developing worldwide, the science of NLP has not, and there is very little research into NLP certification training. This is also true in Japan, where many of its workforce has suffered from poor mental health levels for years. Most of the existing studies, however, were conducted in Western countries. Given the popularity of NLP in Japan, it is worth evaluating the effects of NLP for a Japanese population. Therefore, this study aimed to empirically investigate the effects of NLP certification training for the mental health of Japanese workers.

Hypotheses

Two hypotheses were tested.

H1. There would be significant difference in depression, anxiety, stress, and mental well-being between pre- and post-training.

H2. There would be significant difference in depression, anxiety, stress, and mental well-being between pre-training and three-month follow-up.

Methods

A pre-post test design was used to examine changes in the participants' stress, anxiety, depression, and mental well-being before, immediately after, and three months after NLP Practitioner Certification Training (NLP-PCT). Ethics approval was obtained from the university research ethics committee.

Participants and Trainers

The study participation criteria were to be aged 18 or older, employed, a participant of NLP-PCT, and Japanese living in Japan. Participants who scored 'normal' in all of the three subscales of the Depression, Anxiety and Stress Scale-21 (DASS-21; depression≤9, anxiety≤7, and stress≤14; Lovibond and Lovibond, 1995) at pre-training were excluded to avoid floor effects. Participants who were planning to take or were taking other mental health-related training during the six months of the experiment were also excluded.

Thirty-eight participants from three sessions of NLP-PCT (2016 May, 2016 September, and 2017 January start; each session comprised ten days, five weekends over three months) responded to the first assessment. Five participants were excluded as their levels of depression, anxiety, and stress were all assessed as 'normal' at pre-training. Additionally, three participants who did not complete the surveys were excluded. Accordingly, 30 participants were available for analysis (15 males and females, age M=41.5, SD=12.3 years). No participant reported a current or previous diagnosis of mental health problems such as major depressive disorder. Although the attendance rate of these 30 participants was irretrievable as their responses were anonymised, out of 45 total participants from the three sessions of NLP-PCT, 40 attended all ten days (89%), and five attended eight days - minimum requirement for certification. Furthermore, supplementary lessons were given to those five who missed two days. Therefore, it is assumed 27 out of 30 participants (89%) attended all ten days, and the remaining three attended eight days and took the supplementary lessons.

Procedure

After participants have completed the informed consent to take part, they responded to

the DASS-21 and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), then went onto NLP-PCT. Immediately after the final session, they completed those scales as the post-training assessment. Finally, three months after the training, the participants completed the final assessment (follow-up), and debriefed.

NLP-PCT is usually structured for ten days of training over three months. NLP-PCT trains the participants to integrate NLP in their thinking and behaviour (Hall, 1983), therefore the participants learn to apply NLP skills for themselves to experience the effects. This training aims to enable participants to acquire a fundamental ability to utilise the basic concepts, skills, processes, techniques and patterns of NLP (Hall, 1983) by covering eight areas of NLP - representational systems, rapport-building, anchoring, language patterns, outcome framing, sub-modalities, strategies, and trance. All the skills taught in the training entail theoretical understanding, demonstration, and practice. In order to ensure the quality of their understanding of NLP, participants are required to produce five reports to reflect on their learning (Yamasaki, 2004). As this course is the entry-level course in NLP, there were no prerequisites, apart from Japanese language skills.

Four trainers were involved in this training: a sixty-year-old male (Trainer 1), fifty-four-year-old male (Trainer 2), forty-seven-year-old female (Trainer 3), and forty-five-year-old female (Trainer 4). Trainer 1 was a certified NLP trainer, and the rest were certified NLP trainer associates. Trainer 1 was involved in all the three sessions of NLP-PCT, and the rest were involved in one session each. All of the trainers had been training workers for at least five years. The certification of the NLP trainer associate is higher than NLP practitioner and master practitioner. NLP trainer associates are required to satisfy several conditions to be certified as an NLP trainer including assisting with certification training, 100-hour teaching, and undertaking

Ericksonian hypnosis training (Hall, 1983).

Materials

The participants were asked to respond to the WEMWBS (Tennant et al., 2007) and the DASS-21 (Lovibond & Lovibond, 1995) before, after, and three months after the training. WEMWBS evaluates the degree of their mental well-being, and DASS-21 evaluates the degrees of their depression, anxiety, and stress.

Both of the DASS-21 and WEMWBS have validated Japanese versions available (Hayashi and Takahashi, 2001; Warwick Medical School, n.d.). DASS-21 is a twenty-one item self-report questionnaire to measure the degrees of depression, anxiety and stress. Each item (e.g. 'I found it hard to wind down') is scored from 0 'did not apply to me at all' to 3 'applied to me very much or most of the time'. Each subscale is related to seven different items. The total of each subscale is doubled, and compared with the severity ratings, which include 'normal', 'mild', 'moderate', 'severe', and 'extremely severe'. Internal consistencies of the subscale scores in our sample were acceptable to high (Depression at pre-training α=.76, post-training α=.91, follow-up α=.85; Anxiety at pre-training α=.82, post-training α=.94, follow-up α=.89; Stress at pre-training α=.86, post-training α=.92, follow-up α=.89) (Nunnally, 1978).

WEMWBS is a scale of fourteen positively worded items (e.g. 'I've been feeling optimistic about the future'), with five response categories, for assessing one's subjective mental well-being i.e., one's psychological functioning, satisfaction from life, and ability to nurture reciprocal relationships (Stewart-Brown and Janmohamed, 2008). Each item is scored from 1 'None of the time' to 5 'All of the time' (score range 14-70). The average score of 1749 Scottish people aged 16 to 74 was 50.7 (Stewart-Brown and Janmohamed, 2008). Internal consistencies

of the scores on this scale in our sample were high (pre-training α=.91, post-training α=.95, follow-up α=.94) (Nunnally, 1978).

Statistical analysis

Data analysis was performed with SPSS version 24. After checking the assumptions, a one-way repeated measures analysis of variance (ANOVA) was conducted for all the participants. Post-hoc Tukey analyses were used to examine whether there were differences among different assessment points. Two scores for anxiety at follow-up were identified as outliers using the outlier labelling rule (Hoaglin and Iglewicz 1987), so were winsorised (Tukey, 1962). Assumption of normality was of no concern as a one-way ANOVA was accurate with non-normally distributed data (Plichta and Garzon, 2009). The reliable change criteria (RCC) were calculated by multiplying the standard error of change by 1.96: $SD \times \sqrt{2} \times \sqrt{(1 - \alpha)} \times 1.96$ (Christensen and Mendoza, 1986).

Results

Comparing with 131 Japanese workers across different industries (Kotera et al., 2018), our sample of 30 participants had a higher level of stress (not for depression and anxiety; Depression $t(159)=1.07$, $p=.28$; Anxiety $t(159)=.78$, $p=.44$; Stress $t(159)=2.87$, $p=.01$), therefore RCC were calculated (Christensen and Mendoza, 1986); these were: 8.01 for depression; 8.16 for anxiety; 9.16 for stress; and 7.19 for mental well-being.

All the mean subscale scores of the DASS-21 fell under 'severe' levels in the severity ratings at pre-training. The numbers of the participants who had 'severe' or 'extremely severe' level at pre-training, post-training, and follow-up were 17, five, and five for depression; 22, 14,

and 14 for anxiety; and 16, eight, and eight for stress. The mean mental well-being score was lower than the average of Scottish people (50.7), at pre-training, but exceeded it at post-training and follow-up. The numbers of the participants who scored higher than the Scottish average at pre-training, post-training, and follow-up were ten, 18, and 22. Chi-square tests confirmed i) significant decreases in the proportion of participants with high levels (values at 'severe' or 'extremely severe' labelled as 'high', while values lower than them labelled as 'low') of depression ($p<.001$) and stress ($p=.045$), but not of anxiety ($p=.056$), and ii) significant increase in the proportion of participants with high level (values higher than the Scottish average labelled as 'high', while values lower labelled as 'low') of mental well-being ($p=.006$).

*Table 1. Descriptive statistics (Mean ± SD), chi-square, and a one-way repeated measures ANOVA for the effects of NLP training on mental health (Depression, Anxiety and Stress Scale-21) and mental well-being (Warwick-Edinburgh Mental Well-being Scale) among Japanese workers (n = 30).*

Subscale (range)	Pre-training (*n* of high score)	Post-training (*n* of high score)	Follow-up (*n* of high score)	Chi-Square Sig (*p*).	Omega Squared
Depression (0-42)	$22.60^{ab} \pm 5.90$ (17)	$14.67^a \pm 6.99$ (5)*	$16.27^b \pm 4.92$ (5)	<.001	.23
Anxiety (0-42)	$19.27^{cd} \pm 6.94$ (22)	$13.87^c \pm 7.59$ (14)	$14.73^d \pm 4.59$ (14)	.056	.10
Stress (0-42)	$28.13^{ef} \pm 8.83$ (16)	$18.60^e \pm 8.02$ (8)*	$20.33^f \pm 8.98$ (8)	.045	.20
Mental Well-being (14-70)	$46.40^{gh} \pm 8.65$ (10)	$54.17^g \pm 9.20$ (18)*	$56.63^h \pm 8.27$ (22)*	.006	.19

Shared superscripts (a-h) indicate there is significant difference between the two assessment points (*p*<.001 for a, b, e, h; *p*<.01 for c, f, g; *p*<.05 for d). For depression, anxiety, and stress, 'high score' means 'severe' or 'extremely severe' level in DASS21. For mental well-being, 'high score' means scores higher than he Scottish average (50.7, *n*=1749; Stewart-Brown and Janmohamed, 2008). Stars (*) indicate reliable changes based on the reliable change criteria at pre-training (8.01 for depression, 8.16 for anxiety, 9.16 for stress, and 7.19 for mental well-being).

Figure 1. Levels of depression, anxiety, stress, and mental well-being at pre-training, post-training, and follow-up
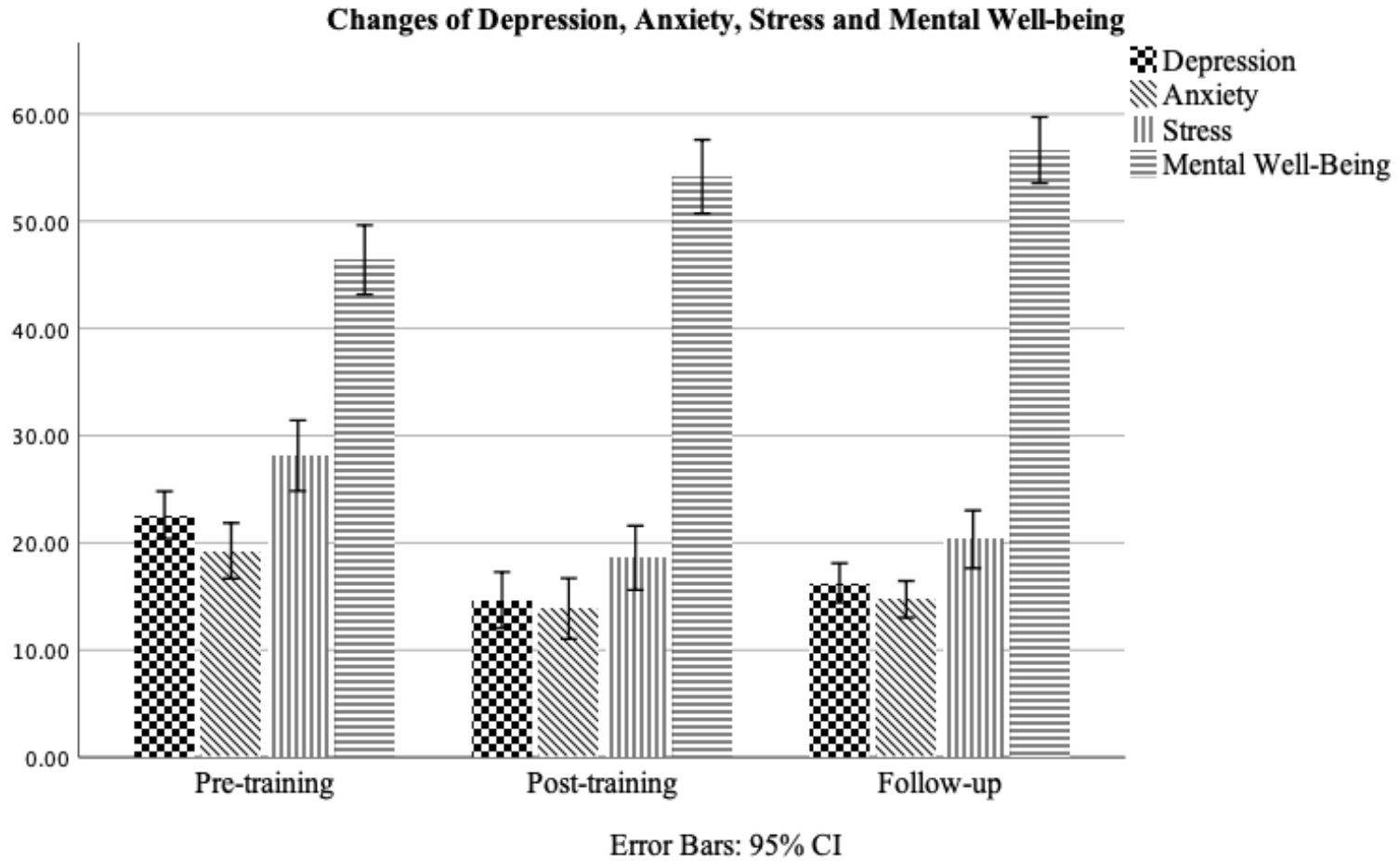
A one-way repeated measures ANOVA was conducted. All the variables changed statistically significantly between different assessment points (Depression $F(2, 87) = 14.68$, $p<.001$, $\omega^2 = .23$; Anxiety $F=5.97$, $p=.004$, $\omega^2 = .10$; Stress $F=11.95$, $p<.001$, $\omega^2 = .20$; Mental well-being $F(2, 87) = 11.27$, $p<.001$, $\omega^2 = .19$). The means of depression, anxiety and stress decreased from pre-training (Depression 22.60 ± 5.90; Anxiety 19.27 ± 6.94; Stress 28.13 ± 8.83) to post-training (Depression 14.67 ± 6.99; Anxiety 13.87 ± 7.59; Stress 18.60 ± 8.02), and increased at follow-up (Depression 16.27 ± 4.92; Anxiety 14.73 ± 4.59; Stress 20.33 ± 8.98). The mean of mental well-being increased from pre-training (46.40 ± 8.65) to post-training (54.17 ± 9.20), and increased further at follow-up (56.63 ± 8.27). Tukey post-hoc analyses revealed that the mean decreases of depression, anxiety, and stress from pre-training to post-training were statistically significant (Depression 7.93, 95% CI [4.24, 11.63], $p<.001$; Anxiety 5.40, 95% CI [1.40, 9.40], $p=.005$; Stress 9.53, 95% CI [4.58-14.49], $p<.001$), as well as the decreases from pre-training to follow-up (Depression 6.33, 95% CI [2.64, 10.03], $p<.001$; Anxiety 4.53, 95% CI [.53, 8.54], $p=.022$; Stress 7.80, 95% CI [2.85, 12.75], $p=.001$), but no significance was found from post-training to follow-up. Likewise, the mean increase of well-being from pre-training to post-training was statistically significant (7.77, 95% CI [-13.13, -2.40], $p=.002$), as well as the increase from pre-training to follow-up (10.23, 95% CI [-15.60, -4.87], $p<.001$), but from post-training to follow-up was not statistically significant. H1 and 2 were partially supported.

Lastly, based on the RCC, 50% ($n=15$) of participants showed reliable improvement from pre-training to post-training, and 56.67% ($n=17$) from pre-training to follow-up in mental well-being; 40% ($n=12$) from pre-training to post-training, and 30% ($n=9$) from pre-training to follow-up in depression; 26.67% ($n=8$) both from pre-training to post-training and from pre-training to follow-up in anxiety; and 50% ($n=15$) from pre-training to post-training, and 36.67%

(*n*=11) from pre-training to follow-up in stress.

Discussion

This pilot study aimed to empirically evaluate the effects of NLP-PCT on mental health in Japanese workers who reported higher levels of depression, anxiety, or stress on the DASS. The NLP-PCT was related to significant improvements in depression, stress, and mental well-being from pre- to post-training. There was no significant difference between post-training and the three-month follow-up on any measure. Moreover, mental well-being scores were higher, and depression and stress were lower at follow-up than at baseline suggesting that the effects of the NLP-PCT were sustained, except for anxiety. The number of participants who had severe or extremely severe levels of depression and stress was also reduced after training and at three-month follow-up. Likewise, the number of participants who had a higher score than the Scottish average increased after training and at the follow-up. These promising results suggest that this NLP certification training needs to be evaluated in more rigorous research designs such as larger scale, controlled trials.

The efficacy of NLP for mental health has been reported in the past; four studies with reasonable methodological quality reported similar effects to the current study. Simpson and Dryden's study (2011) compared an NLP intervention, the visual/kinaesthetic dissociation (VKD) technique and rational-emotive behaviour therapy, for anxiety and depression in patients with panic disorder: though both of the groups experienced significant effects, the VKD group demonstrated larger effects. Five two-hour NLP sessions improved general mental health, depression and anxiety of 52 nursing and midwifery students (Sahebalzamani, 2014). HemmatiMaslakpak et al. (2015) reported 30 nurses' occupational stress reduced significantly

after 18 three-hour NLP sessions, compared with a passive control group. Lastly, Japanese senior managers who have undertaken NLP certification training reported that NLP improved their and their staff's work mental health (Kotera and Van Gordon, 2019). Thus, these studies' findings broadly concur with the present study's findings.

There were no significant differences between post-training and follow-up. This proposes future refinement of NLP training. While the effects were maintained for a long time, they were not enhanced after the training. If the training had fully achieved its purpose of integrating NLP skills into the participants' thinking and behaviours (Hall, 1983), further improvement in their mental health should have been observed. A potential reason for this may be related to difficulties practicing NLP skills in their daily life. Because NLP originated in clinical practice, some of the NLP skills are rather extensive, requiring a long time to be conducted, thus difficult to practice in non-clinical settings such as a workplace (Kotera and Van Gordon, 2019). Brief and easy-to-practice NLP skills should be introduced to participants. Additionally, follow-up NLP sessions are suggested, aiming to further improve participants' mental well-being (Kotera and Sweet, 2019). Considering the busy schedule of Japanese workers, online meetings to revisit NLP skills would be useful. The first author organises an online monthly session for certified practitioners to revisit NLP skills and discuss issues with practicing NLP skills in workplaces. Such an attempt can support NLP practitioners to fully attain the purpose of the NLP training, continuing to gain positive psychological effects.

Additionally, the non-significant differences between post-training and follow-up may highlight the holistic nature of mental well-being, including employees' workplace support and life style (Matsalla and Warners, 2012): it may be challenging to enhance mental well-being by training alone. For example, Japanese workers who regularly exercise reported better mental

health than those who do not (Yoshikawa et al., 2016). Also, trustful organisational culture was associated with better work mental well-being (Zak, 2011). These variables should be considered alongside the effects of training on mental well-being in the future.

The present study addressed a number of weaknesses in previous studies. First, the first author is a certified NLP trainer, and may have deep understanding of NLP: the interventionists in many previous studies (e.g. HemmatiMaslakpak et al., 2015; Sahebalzamani, 2014; Simpson and Dryden, 2011) were either not trained in NLP or training was not specified. In addition, in order to gain generalisability, there were multiple interventionists, who were all trained in NLP: in the above studies (HemmatiMaslakpak et al., 2015; Sahebalzamani, 2014; Simpson and Dryden, 2011), the researchers either had one interventionist only or did not specify. When there is only one interventionist, it is unclear whether the effects are due to the intervention or the interventionist's proficiency. Further, this study examined certification training, which is designed and regulated by the Society of NLP: many previous studies (e.g. Gunenç et al., 2015; HemmatiMaslakpak et al., 2015; Sahebalzamani, 2014; Simpson and Dryden, 2011; Zamini et al., 2009) examined either one skill or training that was not regulated. Thus, the current study affords a more robust test of NLP. Next, there was relatively long time between the post-training assessment and the follow-up assessment: many previous studies had no follow-up or a one-month follow-up (HemmatiMaslakpak et al., 2015; Sahebalzamani, 2014; Simpson and Dryden, 2011). Also, possible seasonal biases were reduced because the three NLP-PCT sessions took place throughout the year. Finally, the present study was conducted in Japan with Japanese workers, who had higher levels of mental health problems. Although the practice of NLP has been reported worldwide, the present study, to our knowledge, is one of the first studies that explored NLP in this population.

There are also a number of limitations to this pilot study. First, the study did not include a comparator group (Torgerson and Torgerson, 2008). Considering the research practicality of the occupational settings, experimental studies with control groups, instead of RCTs, are recommended (Luthans, 2012). Second, all the participants paid a training fee, thus may be biased to provide a positive evaluation of NLP. Third, although it is the standard of NLP-PCT, the group training style might have created a positive bias for Japanese participants who belong to a collectivistic culture where one's awareness of groups is strong (Hofstede and Minkov, 2010), as seen in their interdependent self (Markus and Kitayama, 1991). Therefore, just by convening repeatedly with people who had similar goals and problems may have reduced their mental health problems.

Conclusion

This pilot study reported that the regulated NLP training reduced depression and stress and increased mental well-being in Japanese workers; the positive effects of mental well-being were maintained three months later. Many Japanese workers have poor mental health. Although the practice of NLP is popular worldwide, the science of NLP is still underdeveloped; these findings add to the emerging corpus of evidence. Moreover, NLP-PCT was effective for Japanese workers' mental health and well-being: the number of workers who had high levels of depression or stress reduced and who had high levels of mental well-being increased after training, and was maintained three months later. Although this study addressed many of the weaknesses of previous NLP research, the promising results of this pilot study illustrate the need for larger, longitudinal studies with comparator. Human resource managers and occupational scientists working with Japanese workers' mental well-being may want to further investigate this

training.

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