

Full study protocol and statistical analysis plan

Official title of the study:

The effect of “three good things” positive psychotherapy on burnout, turnover intention, job performance, job satisfaction, self-efficacy, coping styles, resilience and blood cortisol of Chinese nurses.

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Objectives of the study

The aim of this study was to evaluate the effect of “three good things” positive psychotherapy on Chinese nurses’ burnout, turnover intention, job performance, job satisfaction, self-efficacy, coping styles, resilience and blood cortisol. We hypothesis that the "three good things" positive psychotherapy could alleviate nurses' burnout, turnover intention, improve their job performance, job satisfaction, self-efficacy, resilience, introduce nurses' to use positive coping strategies to overcome adversities. Moreover, their blood cortisol would be reduced after the intervention.

Study design and sample

In the present study, we used a randomized, controlled design to assess the effect of “three good things” positive psychotherapy from August 2015 to January 2016. Measures were administered before (T0) and immediately after (T1) the intervention.

The study sample were nurses recruited from one three-level general hospital in Changsha, Hunan, China. The inclusion criteria were: (1) registered nurses or licenced practical nurses, (2) who provided direct care to residents, (3) who's MBI-GS score were no less than 1.5, (4) who didn't take any hormone therapy, (5) were Chinese speakers. The exclusion criteria were: (1) student nurses, (2) who suffered from diseases that influence their hormone levels, (3) who participated similar studies, (4) who had no interest in this study.

The sample size calculation was conducted via PASS statistical software (NCSS LCC, East Kaysville, UT, USA) . The effect size was 0.67, power was 0.80, and margin of error type I was 0.05. Accordingly, the sample size was 64. Stochastic

tables' law was used for group division. A total of 193 nurses completed the MBI-GS, and 102 nurses who met the inclusion criteria were randomly selected for the study. All the recruited participants will be numbered and randomly allocated into two groups by the random number table. However, only 73 completed the study, with 33 in the experimental group and 40 in the control group.

Instruments

A socio-demographic questionnaire, the Maslach Burnout Inventory-General Survey (MBI-GS), the turnover intention questionnaire, the Job Performance scale, the Job Satisfaction scale, the General self-efficacy Scale, the CD-RISC and the Trait Coping Style Scale were used to collect the data. The blood cortisol was also collected. The detail instruction of these scales could be found at Outcome Measures section.

The Maslach Burnout Inventory-General survey (MBI-GS) was developed by Maslach and Jackson (1981) and consists of 16 items over three metrics: emotional exhaustion (EE, five items), cynicism (CY, five items) and reduced professional efficacy (RPE, six items). The items were scored on a Likert scale from 0 (never) to 6 (everyday) (Schaufeli et al. 1996). The higher the scores on the three metrics, the higher level of burnout indicated. The Chinese version of the MBI-GS, developed by Li & Shi (2003), also has a good validity and reliability. In this study, Cronbach alpha coefficients for EE, CY and RPE were 0.93, 0.83 and 0.82, respectively.

The Turnover Intention Scale was developed by Michaels and Spector (1982). The Chinese version was translated by Li and Li (2000). It includes three metrics (the possibility to resign the job, the possibility to find another job and the possibility to

get another job) and 6 items. A 4-Likert scale from 1 (never) to 4 (always) was used to score each item. The higher the score was, the stronger the turnover intention is.

The Job Satisfaction Scale, developed by Tao et al. (2009), includes 38 items. A 5-Likert scale from 1 (totally agree) to 5 (totally disagree) were used to score each item. The total score of job satisfaction ranges from 38 to 190, with higher score indicating higher levels of job satisfaction. The Cronbach alpha was 0.783 in this study.

The Job Performance Scale consists 16 items and 3 metrics (job denotion, task performance and interpersonal promotion). A 6-Likert scale from 1 to 6 was used to score nurses' job performance. The final score of the three metrics were the total score of their items. The Cronbach alpha of the three metrics in this study were 0.842, 0.904 and 0.927, respectively.

The blood sample were collected on a day during the third to the tenth day of the menstrual cycle. Participants were instructed not to eat or drink anything other than water, and not to undertake any strenuous exercise 2 h or smoking 30 min before a blood sample was taken. Five trained researchers drew the blood samples between 7am-9am at an experimental lab. Nurses were instructed to take a blood sample at their convenient time. Blood was collected using vacuum blood collection tubes (Hubei Jin Xing Technology Co. Wuhan) and sent to an endocrinology laboratory for biochemical analysis at no cost to the participants (Endocrinology Laboratory, The Second Xiangya Hospital of Central South University, Dr. Z.X. Gui). Blood samples were centrifuged at 4000 rpm for 2 min in order to get a clear supernatant. Blood

cortisol was measured using an immunoassay with chemiluminescence detection (ADVIA Centaur XP Immunoassay System, Siemens, Germany).

The CD-RISC was used to measure nurses' resilience level (Connor & Davidson 2003). This scale comprises 25 items over three metrics (tenacity, strength and optimism) that assess resilience or capacity to change and cope with adversity. Nurses were asked to rate each item with reference to the previous month. A 5-point Likert scale was used (0 = not true at all, 4 = true all the time.). The total score ranges from 0 to 100, with higher scores indicating higher levels of resilience. The Cronbach alpha coefficients of the Chinese version were 0.91 for the total score, 0.88, 0.80 and 0.60 for the three factors

Self-efficacy was defined as the average score on the General Self-efficacy Scale. The scale is a single-dimension scale with 10 questions. Each question is assigned points from 1 to 4, and the final score is the total score of the 10 questions. The Chinese version also has a good validity and reliability with a Cronbach alpha is 0.88.

The TCSS consists of 20 items over two metrics: positive coping style (PCS, 10 items) and negative coping style (NCS, 10 items). The items were scored on a five-point Likert scale from 1 to 5. The final scores of PCS and NCS were the total scores of their items. The Cronbach alpha coefficients of the two metrics were 0.70 and 0.69, respectively.

Interventions

The experimental group received a six-month Wechat-based “three good things”

positive psychotherapy from August 2015 to January 2016. Participants were directed to record three good things in the Wechat friends cycle. These things could be minor, ordinary, or important. Next to each good things, participants were required to answer the question:" Why did this good thing happen"? The record could be open to others or only open to the researchers. The researchers has the responsibility to supervise the implementation of the intervention and explain the confusion of the participants during the intervention period. While, the control group only received normal psychological instruction from the hospital.

Data analysis

Data analysis was performed using SPSS 22.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics was used to describe demographic data, burnout, turnover intention, job performance, job satisfaction, self-efficacy, resilience, coping style and cortisol. Generalized repeated-measures analysis of variance (ANOVA) was used to demonstrate the effect of intervention and time-intervention interaction. All statistical tests were two sides ($\alpha=0.05$).