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Effects of a yoga nidra on the life stress and self-esteem in university students

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ABSTRACT

Objectives: To assess the effects of a yoga nidra on life stress and self-esteem in university students.
Methods: This study is a non-equivalent control group pretest-posttest design. Forty university students were selected by convenience sampling, with 20 assigned to a yoga nidra group and 20 to a control group. The yoga group participated in bi-weekly, 1-h sessions of yoga nidra for 8 weeks. Life stress intensity level was measured using a 10 cm Visual Analog Scale. Self-esteem score was measured by Rosenberg's Self-Esteem Scale.
Results: The yoga nidra group showed significantly decreased life stress intensity levels compared to the control group. The yoga group also showed significantly increased self-esteem scores compared to the control group.
Conclusions: These findings indicate that yoga nidra could alleviate the life stress intensity level and increase the self-esteem in university students.

1. Introduction

Life stress is closely linked with the strains that humans experience in their living environment. Across all ages, university students appear to be particularly vulnerable to life stress [1]. According to previous studies, university students' life stress generally emerged from interpersonal relationships with friends, family, or professors as well as challenges in academic performance, economic concerns, future planning, and values [2–7]. Various challenges faced in interpersonal relationships can present as stressors for university students. Some studies suggested that these stressors can be implicated in university students' physical and psychosocial health problems if they do not appropriately manage the struggles they face [4,6,7]. The prevalence of psychological problems secondary to low self-esteem is higher in university students than in the general population [1,8,9].

Self-esteem refers to an individual's evaluation of self-satisfaction and self-worth [9–12]. Self-esteem also acts as an important determinant of individual behavior [9,10]. Generally, people who evaluate themselves positively are confident, affectionate to others, socially and psychologically stable, and demonstrate job productivity [12]. On the other hand, people with low self-esteem may experience negative emotions such as depression and anxiety, and are more likely to be involved in workplace bullying [12]. Furthermore, low self-esteem was prominent in people who do not adjust appropriately to stress [6,7]. As mentioned above, self-esteem is closely associated with stress and identified as a major predictive variable of stress management [13]. Therefore, it is presumed that relaxation approaches should be applied to reduce stress and increase self-esteem.

Recently, yoga nidra relaxation measures have emerged as a control method for stress [14–16]. Yoga nidra is also being introduced as an intervention to improve self-esteem [10]. Yoga nidra means "psyche sleep" [17]. Studies reported that the yoga nidra practice brings about a hypothalamic response, activating the parasympathetic nervous system and suppressing the sympathetic nervous system activity [16–18]. Based on this theory, yoga nidra practice brings a deeply relaxed state of body and mind, while conscious minds are clearly alert to realize what they are experiencing. Yoga nidra also provokes relaxation and tranquility of nerves and eliminates unconscious deep-rooted mental tension [14,17,18]. Taken into consideration, the theoretical basis for the relaxation effect of yoga nidra is that it generally activates the parasympathetic nervous system to alleviate mental and psychological symptoms. During yoga nidra, our consciousness and mind have been reported to go deeper into inner steps of psyche sleep than normal sleep, resulting in greater awareness of joy and allowing for intense relaxation and rest [15,16]. Additional advantages of yoga nidra include affordability, noninvasiveness, safety, and accessibility compared to other intervention methods [15,16]. Nevertheless, the effects of yoga nidra on stress and self-esteem in university students were rarely studied [10], and this study set out to explore correlation between yoga and well-being in this group.

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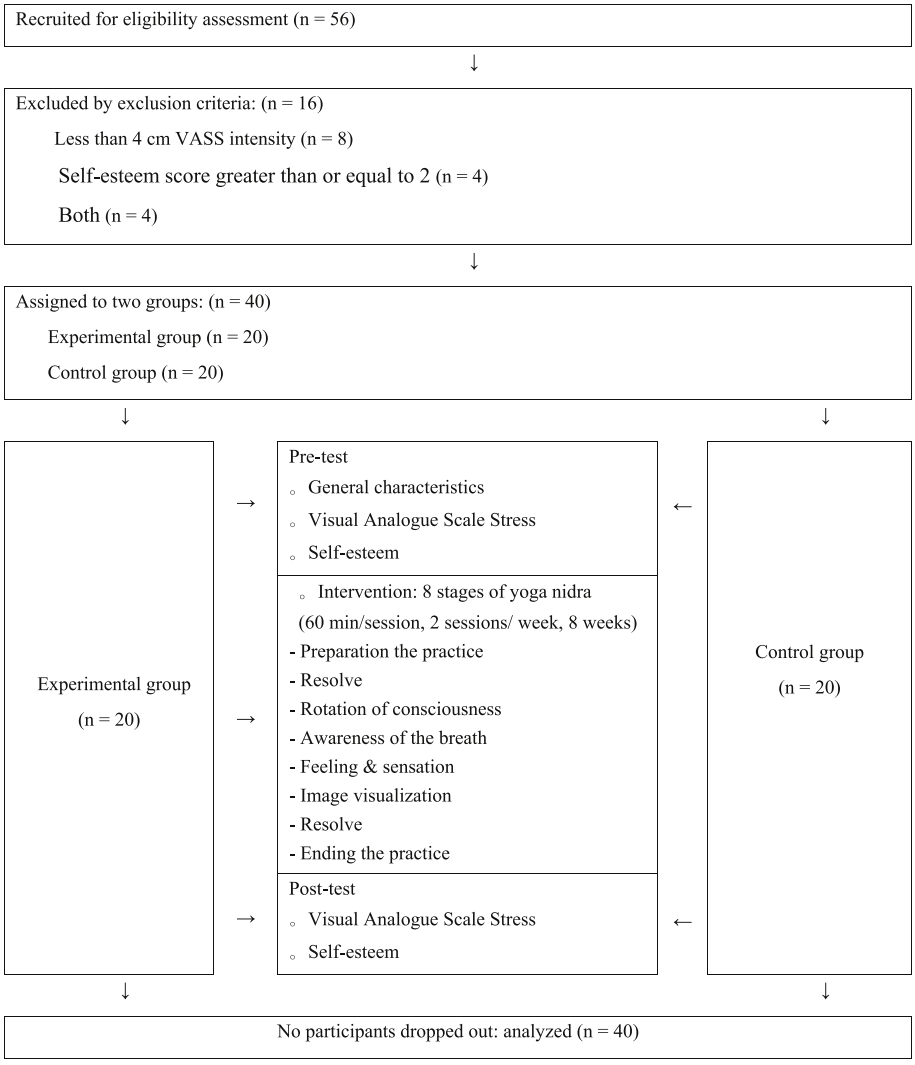

Fig. 1. Flow chart of the study.

2. Materials and methods

2.1. Design

This study is a non-equivalent control group pretest-posttest design to assess the effect of yoga nidra on life stress and self-esteem in university students. The research design is presented in Fig. 1.

2.2. Location of the study

Yoga nidra was performed in a health assessment laboratory in the Health Science College of Kangwon National University.

2.3. Population and sample

Participants of this study were recruited through a social networking service. The participants were students in a university near the Samcheok-si area in Republic of Korea. The inclusion criteria for selecting participants were: A university student who agrees to participate in this study; a university life stress score of 4 cm or more on the 10 cm Visual Analog Scale for Stress (VASS), which was modified from the Likert Scale to VAS from the Revised Life Stress Scale for College Students [2,3,19,20]; a Rosenberg's Self-Esteem score of less than 2 on a 5 Likert Scale; and no experience of yoga nidra [9,21].

Sample size was determined using G*Power 3.1 based on data from a previous study [10]. In total, 56 volunteers enrolled in the initial phase of the study. After participants received detailed study information, they signed a written informed consent form and self-recorded their VASS and self-esteem score. Sixteen students who had a VASS intensity less than 4 cm (n = 8), a self-esteem score greater than or equal to 2 (n = 4), or both (n = 4) were excluded. The remaining 40 participants were assigned to two groups by their choosing and completed the entire study, 20 in the yoga exercise group and 20 in the control group.

2.4. Study procedures

This study was approved by the Institutional Review Board of Kangwon National University (KWNUIRB-2017-01-002-002). Yoga nidra was the sole intervention used to study stress. Yoga nidra is a compound word consisting of yoga, which means unity, and nidra, which means sleep; together defined as “psyche sleep” [14]. Yoga nidra consists of eight stages: preparation of the practice, resolve, rotation of consciousness, awareness of the breath, feeling and sensation, image visualization, resolve, and ending of the practice [17]. The process of this study is shown in Fig. 1. The instruction of yoga nidra was conducted by the guidance and supervision of an instructor who trained at Bihar Yoga Bharati (BYB) in India. Students attended two 60-min yoga nidra sessions per week for 8 weeks in accordance with the training guidelines of the yoga nidra program provided by BYB. The importance

Table 1
Homogeneity test for baseline demographic characteristics, life stress, and self-esteem.

Variables	Yoga group (n = 20)	Control group (n = 20)	t/F	p
	Mean ± SD			
Age	22.0 ± 0.1	21.6 ± 0.2	1.436	.159
Sex, n (%)				
Female	19 (95.0)	17 (85.0)	1.111	.605
Male	1(5.0)	3 (15.0)		
Department				
Nursing	20 (100.0)	17 (85.0)	3.243	.231
Others	0 (0.0)	3 (15.0)		
Students' year				
3rd year	20 (100.0)	18 (90.0)	2.105	.487
4th year	0 (0.0)	2 (10.0)		
Overall stress	7.2 ± 1.2	6.7 ± 2.5	0.832	.411
Subscales of stress				
Friend of the same sex	5.1 ± 1.8	4.4 ± 2.6	1.091	.282
Friend of opposite sex	3.5 ± 2.4	3.5 ± 3.4	0.053	.958
Family	4.0 ± 2.1	3.9 ± 2.8	0.063	.950
Professor	3.9 ± 2.6	3.5 ± 2.6	0.455	.652
Economic problems	4.7 ± 2.3	5.9 ± 2.5	−1.670	.103
Future plans	6.7 ± 1.3	7.1 ± 2.2	−0.779	.441
Academic performances	8.0 ± 1.3	7.6 ± 1.8	0.719	.477
Value problems	6.7 ± 1.5	6.8 ± 1.8	−0.186	.853
Self-esteem	16.7 ± 1.8	18.8 ± 2.1	1.448	.145

of yoga nidra is not the body movement but rather the self-awareness of the participants under the direction of the instructor. In the preparation stage of the practice, the participants remove their watches, glasses, and mobile phones from their bodies and close their eyes with their palms facing upward in a comfortable position lying on the floor. In this stage, the participants' body and mind start to relax and rest, but the participants retain consciousness. In the resolve stage, the participant's desire is repeated three times with very simple and positive phrases. In the rotation of consciousness stage, the participant's consciousness is followed from their head to their toes, their right side to the left, according to the direction of the instructor. During the awareness of the breath stage, participant's consciousness concentrates upon 10 deep breaths, tracking the rate. In the feeling and sensation stage, the instructor directs participants to feel a sense of contrast to their body. For example, participants are encouraged to feel that their bodies are as light as a bird or as heavy as rocks. In the image visualization stage, participants consciously think of the words that correspond to the events or things that the instructor indicates. For example, the participant is reminded of their most painful moments, their happiest moments, or the joys of life, and to feel the corresponding emotion. In the resolve stage, the participants determine their desire consciously once again. In the ending of the practice stage, the participants let their body and mind slowly return to reality, according to the instructor's guide. The instructor directs the participants to move slowly moves their bodies. It is important that the instructor does not allow the participant to sleep while the yoga nidra is performed and to make the participant's consciousness clear. The yoga nidra group was instructed not to participate in any other exercises, including other forms of yoga, while taking yoga nidra classes. Considering how social interaction among yoga nidra group members could act as a disturbance variable for the effect of the yoga nidra, the yoga nidra group was instructed not to interact with one another and refrain from meeting with the control group when possible. The control group did not attend yoga nidra classes and had no restrictions on individual daily activities or exercises.

2.5. Data collection

Demographic information, VASS intensity, and self-esteem scores were measured before initiation of the yoga nidra classes. VASS intensity and self-esteem scores were repeated after yoga class completion 8 weeks later.

In this study, VASS consisted of 1 item of overall life stress and 8 items of subscale life stress. The subscale life stress variables included strain due to a friend of the same or opposite sex, family, a professor, future plans, economic problems, academic performances, and value problems. The 8 items of subscale life stress were extracted from stress related items in previous studies on stress in Korean and non-Korean university students. In a preliminary evaluation of college life stress using a Likert scale, students indicated that it is more convenient to evaluate with VASS because the Likert scale items are overly duplicated. The stress intensity was derived using a 10 cm VASS in which a line was calibrated from 0 to 10, with 0 representing “no stress” and 10 representing “worst stress imaginable” [19,20]. Participants reported their perceived stress levels by pointing to the appropriate value on a 10 cm horizontal ruler [19,20]. Higher scores denoted higher stress intensity.

Self-esteem was measured by Rosenberg's Self-Esteem Scale [6,9,21]. The tool consists of 10 questions, 5 positive and 5 negative questions, which are scored on a Likert 5-point scale. The 5 positive items ranged from “strongly disagree” to “strongly agree” and scoring from 1 to 5; the 5 negative items were reverse scored. The higher the total score, the higher the self-esteem level [6,9,21]. In this study, Cronbach's α value was 0.97.

2.6. Data analysis

Statistical analyses were conducted using IBM SPSS Statistics for Windows (Version 22.0). Data are presented as mean ± standard deviation or as numbers and percentages. The pre-scored demographic, life stress intensity, and self-esteem score homogeneity was analyzed using t or χ^2 test statistics. Significant differences were calculated by independent two-sample t-tests between groups, and paired sample t-tests within groups. Treatment effects were reported as group differences including their respective 95% confidence intervals (CIs) and $p < 0.05$ was considered statistically significant. The comparability of outcomes measures was estimated by Hedges’ effect sizes [22].

3. Results

3.1. Life stress

Table 1 shows that the baseline demographic, life stress, and self-esteem characteristics in the yoga nidra and control groups were homogeneous.

As shown in Table 2, after week 8, the yoga nidra group had a significant decrease in overall stress intensity (between-group difference was −2.8; 95% CI, −4.2 to −1.4; $p < 0.001$) compared with the control group and the effect sizes were estimated as large (−1.30; 95% CI, −1.97 to −0.63).

After week 8, the yoga nidra group had a significant decrease in subscale stress due to friend (between-group difference was −2.7; 95% CI, −4.1 to −1.3; $p < 0.001$), friend of opposite sex (between-group difference was −3.6; 95% CI, −5.0 to −2.2; $p < 0.001$), family (between-group difference was −2.6; 95% CI, −3.9 to −1.3; $p < 0.001$), professor (between-group difference was −2.1; 95% CI, −3.4 to −0.7; $p < 0.05$), economic problems (between-group difference was −2.2; 95% CI, −3.6 to −0.8; $p < 0.05$), future plans (between-group difference was −3.4; 95% CI, −4.7 to −2.1; $p < 0.001$), academic performances (between-group difference was −3.0; 95% CI, −4.4 to −1.5; $p < 0.001$), and value stress intensity (between-group difference was −3.8; 95% CI, −5.0 to −2.0; $p < 0.001$) compared with the control group.

The effect sizes of the subscale stress were estimated as large in friend (−1.25; 95% CI, −1.93 to −0.58), friend of opposite sex

Table 2
Effects of yoga nidra on life stress and self-esteem in university students.

Variables	Yoga (n = 20)		Control (n = 20)		Group Difference	Effect Size[b]	*p*
	Baseline	Week 8	Baseline	Week 8	(95% CI)	(95% CI)	
Stress							
Overall stress	7.2 ± 1.2	4.1 ± 2.5[a,**]	6.7 ± 2.5	7.0 ± 1.6	−2.8 (−4.2; −1.4)	−1.30 (−1.97; −0.63)	.000**
Subscale stress							
Friend of the same sex	5.1 ± 1.8	2.8 ± 2.1[a,*]	4.4 ± 2.6	5.6 ± 2.0	−2.7 (−4.1; −1.3)	−1.25 (−1.93; −0.58)	.000**
Friend of opposite sex	3.5 ± 2.4	2.2 ± 1.8[a,*]	3.5 ± 3.4	5.8 ± 2.5[a,*]	−3.6 (−5.0; −2.2)	−1.60 (−2.31; −0.89)	.000**
Family	4.0 ± 2.1	2.2 ± 1.8[a,*]	3.9 ± 2.8	4.9 ± 2.0	−2.6 (−3.9; −1.3)	−1.28 (−1.96; −0.60)	.000**
Professor	3.9 ± 2.6	2.7 ± 2.2[a,*]	3.5 ± 2.6	4.9 ± 2.0[a,*]	−2.1 (−3.4; −0.7)	−0.97 (−1.63; −0.32)	.003*
Economic problems	4.7 ± 2.3	3.4 ± 2.4[a,*]	5.9 ± 2.5	5.6 ± 1.9	−2.2 (−3.6; −0.8)	−0.64 (−1.28; 0.00)	.003*
Future plans	6.7 ± 1.3	4.0 ± 2.3[a,**]	7.1 ± 2.2	7.5 ± 1.6	−3.4 (−4.7; −2.1)	−1.70 (−2.43; −0.98)	.000**
Academic performances	8.,0 ± 1.3	4.8 ± 2.5[a,**]	7.6 ± 1.8	7.5 ± 1.6	−3.0 (−4.4; −1.5)	−1.23 (−1.90; −0.55)	.000**
Value problems	6.7 ± 1.5	3.0 ± 1.8[a,**]	6.8 ± 1.8	6.9 ± 1.9	−3.8 (−5.0; −2.0)	−1.98 (−2.74; −1.22)	.000**
Self-esteem	16.7 ± 1.8	40.5 ± 7.1[a,**]	15.8 ± 2.1	26.3 ± 7.5	14.2 (9.5; 18.9)	1.90 (1.15; 2.65)	.000**

P-values of difference group were calculated by independent two-samples *t*-test and paired-samples *t*-test, mean group difference and standardized effect size with 95% confidence intervals (95% CI).
$p < 0.05$: *, $p < 0.0001$: **.
[a] Significantly different from baseline.
[b] bias corrected effect size by Hedges.

(−1.60; 95% CI, −2.31 to −0.89), family (−1.28; 95% CI, −1.96 to −0.60), professor (−0.97; 95% CI, −1.63 to −0.32), future plans (−1.70; 95% CI, −2.43 to −0.98), and academic performances (−1.23; 95% CI, −1.90 to −0.55), and value stress intensity (−1.98; 95% CI, −2.74 to −1.22), except for the economic stress intensity (−0.64; 95% CI, −1.28 to −0.00), respectively.

From baseline to week 8, the mean post-intervention overall stress and subscale stress intensity levels in all variables due to friend, friend of opposite sex, family, professor, economic, future, academic, and value problems in the yoga nidra group decreased significantly compared with pre-intervention intensity levels ($p < 0.05$).

3.2. Self-esteem

As shown in Table 2, after week 8, the yoga nidra group had a significant increase in self-esteem score level compared with the control group (between-group difference was 14.2; 95% CI, 9.5 to 18.9; $p < 0.001$) and the effect sizes was estimated as large (1.90; 95% CI, 1.15 to 2.65). From baseline to week 8, the mean post-intervention self-esteem score level in the yoga nidra group increased significantly compared with their pre-intervention score level ($p < 0.0001$).

3.3. Side effects

Twenty participants in the yoga nidra group reported entering a sleeping state during the yoga nidra practice; some participants snored. Except for sleeping, no participants reported side effects associated with yoga nidra intervention during the 8 weeks.

4. Discussion

As demonstrated in these study findings, the yoga nidra group showed a significant reduction of overall life stress intensity with large effect size as compared to the control group. Of the life stress subscales, the stress intensity due to value concerns had the highest effect size. It is presumed that the stress due to value problems can be converted from a stressful state to positive thinking because of stimulation of the parasympathetic nerves of the hypothalamus during yoga nidra. The stress intensity due to economic problems had the lowest effect size. We hypothesize this is due to the fact that participating students were unable to hold a job or earn money. Findings of this study were not directly comparable with those of previous studies because few studies have expressed effects of yoga nidra applied for reducing life stress in university students, but rather other social groups. One previous study reported that yoga nidra significantly reduced perceived stress in adolescent students [23]. Another study pointed out that yoga nidra had a statistically significant reduction in perceived stress of college students from 18 to 56 years old [24]. One study suggested that college professors too, could use yoga nidra as an effective tool in reducing stress [18]. Another study demonstrated that yoga nidra had a potential benefit in nurses' stress reduction [20]. In addition, it has been reported that the use of yoga nidra also reduced the anxiety and negative emotional response in 11 subjects with post-traumatic stress disorder [25]. Similarly, in women with psychological problems such as depression, anxiety, and daily stress during their menstrual period had significant reduction of stress level [15]. As seen in previous studies, our study of yoga nidra revealed favorable outcome as a relaxation method to lessen stress intensity in university students.

As shown in this study, the score of self-esteem was significantly increased in the yoga nidra group with large effect size compared with the control group. These findings are similar to those of a previous study in which yoga nidra generated a significant increase in self-esteem score in college level nursing college students [10], and improved participants' self-esteem in 10–15 years old boys [14]. Self-esteem is generally influenced by stress, and stress is considered a trigger to lower self-esteem [9,13]. According to the theoretical basis, these findings imply that yoga nidra improves the self-esteem by lowering participants' stress intensity. Therefore, the present study also supports that yoga nidra's relaxation mechanism and effects may increase the activity of the parasympathetic nervous system, thereby alleviating mental and psychological stress as well as improve self-esteem [16–18]. In addition, the effects of yoga nidra have been explored in terms of psycho-neuro-physiological variables, particularly in the increase of EEG frequency, stimulation of dopamine and imipramine secretion, and additional hormones related to other psychological variables [8,14]. Future studies are required to clarify the neurophysiological effects of yoga nidra. Furthermore, prior studies reported low self-esteem in university students, while few studies applied yoga nidra to increase self-esteem in these students [6,7,9,10,12]. This implies that a strategy development and effectiveness evaluation are required to reduce college life stress and improve self-esteem in various educational environments.

The advantages of this study are as follows: This study may be the first of its kind to apply yoga nidra to alleviate life stress and improve the self-esteem in university students. All participants completed the study, and there were no adverse effects of yoga nidra. Interestingly, one participant felt pain in her breast during the rotation of consciousness phase, when participants are instructed to concentrate upon their chest. After medical examination, breast cancer was discovered as

the underlying cause of pain, and the participant underwent surgery. This may support the use of yoga nidra as a method of self-health screenings.

This study has the following limitations: Firstly, these findings cannot be easily generalized due to small sample sizes of the participants. Secondly, methodological problems include non-random group assignment, selection bias as an open trial, and no assigned treatment in the control group. There was no limitation of social interaction between the yoga instructor and the participants because the instructor was their professor. Future studies comparing effectiveness using rigorous methodology, considering the gender of the participants and educational environment in various countries and regions, are needed.

5. Conclusion

Yoga nidra has a favorable effect on stress associated with university life and self-esteem. However, future studies are required to identify neurophysiologic effects or compare effectiveness applying more rigorous and higher quality research methodology, considering the gender and educational environment including various countries and regions of the participants.

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Disclosure statement

Conflicts of interest: none

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2019.03.004.

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