



## Effects of Job Satisfaction Interventions in Reinforcing Intrinsic Motivation for Hospital Nurses: A Meta-Analysis

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**Purpose:** Nurses' job satisfaction corresponds with personal intrinsic value, and is the strongest predicting turnover and job retention intention. This study identified the effectiveness of job satisfaction interventions related to reinforcing intrinsic motivation (JSI-RIM) for hospital nurses. **Methods:** This study used four core non-Korean databases (Cochrane Library, CHINHL, EMBASE, PubMed), and five Korean databases to search for RCT and NRCT articles published in English and Korean from inception to June 2019. Meta-analysis was performed using the RevMan 5.3.5 program. **Results:** Thirteen studies featuring 645 hospital nurses were selected for final analysis. A significant large effect was noted on self-efficacy. The effect size on perceived stress and job satisfaction were moderate; however, the effect on resilience outcomes was not significant. **Conclusion:** This study generated scientific evidence that would facilitate efficient job adaptation for nurses. Additionally, intrinsic factors, including job identity and meaning of work, need to be included in JSI-RIM.

**Key Words:** Hospital nurse; Job satisfaction; Meta-analysis; Motivation; Turnover

### INTRODUCTION

In most Organization for Economic Co-operation and Development (OECD) countries, nurses play a vital role in providing healthcare services, both at the primary care level (especially in chronic illness management) and in hospitals or traditional long-term care facilities. In several OECD countries, the present day problem of increasing demand for nurses to keep pace with the aging population, coupled with the retirement of the 'baby-boom' generation nurses, has become the major cause for the escalating nursing shortage anticipated in the near future (Ministry of Health and Welfare [MOHWa], 2018).

Although experts identified the shortage and high turnover rate of nurses in Korea as a social issue in the 1990s and suggested solutions and plans, the problem has continued for almost 30 years and is yet to be solved. In 2017, of the 356,000 total licensed registered nurses, only 180,000

(50.6%) comprise active duty nurses (MOHWb, 2018).

High turnover rates increase the on-duty nurses' workload, decrease their work motivation, and eventually influence their decision to resign. In addition to causing this vicious cycle (Cho, 2016), they also directly or indirectly raise the social financial burden and decrease the qualitative and quantitative nursing competence for patients, leading to a reduction in the overall quality of healthcare facilities, which in turn, puts public healthcare safety at risk (Hayes et al., 2012).

To resolve the nurse turnover problem, there is a need for policies that would reinforce external factors such as maintaining a proper ratio of patients to nurses and improving the external working environment. Despite the work environment being unsatisfactory to a certain degree, another robust solution that could be considered simultaneously is educational programs that would first locate and then reinforce the intrinsic motivation factors to

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increase job satisfaction (Stegar, Duffy, & Dik, 2012; Choi & Kim, 2016).

Job satisfaction has been defined as the individual's psychological manner in approaching his/her work amiably (Hayer et al., 2012; Leineweber et al., 2016); and this behavior is generally closely connected to organizational behaviors such as turnover, absence from work (Hwang & Kim, 2019; Labrague et al., 2020), personal quality of life, and physical and psychological health (Bliese, Edwards, & Sonnentag, 2017). According to the literature review, there are various intrinsic and extrinsic factors that influence nurses' job satisfaction (Tourangeau, Patterson, Saari, Thomson, & Cranley, 2017). In general, job satisfaction increases when job extrinsic characteristics such as work variation, task identity, role importance, autonomy, and feedback are stronger, as well as when there is job clarity (Gong & Son, 2012).

However, intrinsic factors play an important role because human beings' actions are not just passive reactions to certain stimulants but rather an active response to the environment through certain intrinsic processes (Ma, Yang, Wang, & Zang, 2018). A previous study emphasizing the essential role of intrinsic factors in the work environment reported that a human being works diligently for the goals of accomplishing work itself and finding joy, rather than extrinsic factors such as working conditions, compensation, and ranking authority (Stegar, Duffy, & Dik, 2012). Further, the meaning of work, which is an intrinsic factor, has a positive statistical correlation with job satisfaction and a negative relationship with absenteeism or turnover intention (Pavilish & Hunt, 2012; Park & Jung, 2016).

The meta-analysis results on turnover and work intention of clinical nurses in the last ten years revealed that emotional labor, role conflict, work-home conflict, work overload, workplace violence, shift work, and marital status were the factors that accelerated the turnover intention (Lee & Kang, 2018), whereas organizational commitment, job satisfaction, clinical work environment, leadership, age, physical-mental health, and a positive personality were the factors that suppressed turnover intentions (Park & Lee, 2018). A significant number of studies have also reported features such as personal intrinsic value, education, communication skills, interpersonal relationships, and resilience, self-efficacy, loss of motivation, depression, and burnout as the main factors related to job satisfaction of nurses (Stegar, Duffy, & Dik, 2012; Lee, Yeo, Jung, & Byun, 2013; Park & Jung, 2016).

This meta-analysis aimed at a comprehensive review of the effect sizes on the job satisfaction interventions related to intrinsic motivation reinforcement targeting hospital

nurses. We conducted a systematic review and meta-analysis to identify the effectiveness of the job satisfaction interventions related to intrinsic motivation reinforcement (JSI-RIM) for hospital nurses.

The current study's purpose was to: (a) identify the characteristics of selected studies through the literature search process, (b) evaluate the quality of included studies, and (c) calculate an estimate of effects on JSI-RIM with their heterogeneity.

## METHODS

### 1. Design

This study was conducted according to The Preferred Reporting Items for Systematic Reviews and Meta-Analysis [PRISMA] (Moher, Liberati, Tetzlaff, & Altman, 2009).

### 2. Ethics Approval

Ethical approval for this research process was exempt from deliberation through the institutional review board (IRB) of the Sahmyook University which one of the researchers was affiliated (SIRB-2019079).

### 3. Search Strategy

To minimize errors in the search process, researchers selected three exemplary studies related to this research topic, after which a meeting was conducted to identify appropriate search keywords and discuss the proper procedure for systematic review and meta-analysis.

Nine core electronic databases (non-Korean, including Cochrane Library, CHINHL, EMBASE, PubMed, and Korean, namely KISS, KMBASE, NANET, NDSL, and RISS) were used for data retrieval. From inception to June 2019, RCT and NRCT articles published in Korean and English were searched. The main search terms based on MeSH term were: Nurses OR Healthcare provider OR Nursing Staff OR Licensed Practical Nurses AND Person-Centered Psychotherapy OR Emotion-Focused Therapy OR Resilience, Psychological OR Psychotherapy, Psychodynamic OR Mindfulness OR Psychotherapy, Group OR Mentoring OR Crisis Intervention AND controlled clinical trials OR randomized controlled trials. The search terms were changed according to database criteria.

### 4. Eligibility Criteria

Eligibility criteria for meta-analysis followed the PICOS

(participants, interventions, controls, outcomes, and studies). The participants were limited to domestic and foreign clinical nurses. The interventions included all types of programs to enhance job satisfaction by strengthening intrinsic motivation. However, programs or education to improve nurses' competencies on clinical skills and techniques were excluded. The non-intervention group that did not receive the job satisfaction education program was treated as the control group. The outcomes were perceived stress, self-efficacy, resilience, and job satisfaction. Randomized controlled trials (RCTs) and non-RCTs (NRCTs) were included. Studies that included insufficient data (e.g., mean, SD, P value) for which effect size cannot be calculated were excluded.

## 5. Study Selection and Data Extraction

The title and abstract of related articles were exported using Refworks and duplicate papers were removed. Four authors independently reviewed whether exported papers met the inclusion criteria. Disagreements, if any, were debated rationally to arrive at a consensus, and the reason for exclusion was documented. PRISMA was used to easily evaluate each process. Extracted data were organized into the following categories: author, publication year, country of study, study design, participants' mean age, sample size, intervention (name, duration, session number, duration per session), and outcome variables with measurement tools.

## 6. Assessment of Quality of Included Studies

RCT studies were assessed using the Revised Cochrane risk-of-bias tool for randomized trials (RoB 2), which was revised on August 22, 2019 by the RoB 2 Development Group (Higgins, Savovic, Page, & Sterne, 2019). The five domains of RoB 2 were randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selection of the reported result. Respondents selected 'yes', 'probably yes', 'probably no', 'no', or 'no information' for each item. The Risk of Bias Assessment tool for Non-Randomized Studies (RoBANS) was used for NRCTs (Higgins et al., 2019). NRCTs were assessed by six areas of RoBANS: selection of participants, confounding variables, measurement of intervention (exposure), blinding for outcome assessment, incomplete outcome data, and selective outcome reporting. Quality evaluation was processed by four authors.

## 7. Statistical Methods

When quantitative synthesis was possible among the selected documents, meta-analysis was performed using RevMan software 5.3. The random effects model was applied because heterogeneity was assumed in the intervention methods, measurement tools, and subject characteristics among the selected studies. The effect size was calculated by mean and standard deviations and standardized mean difference (SMD). Cohen's *d* was used because various measurement tools were used in each study. The effect of each outcome variable and the 95% confidence interval were analyzed by inverse variance. A Cohen's *d* of 0.8 was considered large, 0.5 medium, and 0.2 small (Cohen, 1988).

The heterogeneity (apparent diversity in weighted mean differences across studies) examined the  $\chi^2$  distribution using  $I^2$  statistic (Higgins et al., 2019). In addition, subgroup analysis was divided into two groups according to age and period of employment.

# RESULTS

## 1. Study Selection

The study selection process is presented in Figure 1. In the first step, 5,187 articles were extracted and 2,345 articles were excluded through duplicate inspection in Refworks. After removing articles that did not meet the selection criteria, 93 articles remained. Following review of the full text, 80 papers were excluded because they were not suitable for meta-analysis. Finally, 13 articles involving 12 NRCTs and 1 RCTs (Figure 1) were used for meta-analysis.

## 2. Quality Evaluation of Included Studies

The quality evaluation (Table 1) was performed after the pilot test for one RCT and one NRCT study, and the agreement rate among researchers reached almost 100%.

An RCT article was rated as low risk in all evaluation criteria of RoB 2 (randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selection of the reported results).

Twelve NRCT studies were assessed for selection of participants, confounding variables, measurement of intervention (exposure), blinding for outcome assessment, incomplete outcome data, and selective outcome reporting using RoBANS evaluation criteria. Six studies (50%) were rated as low risk using six evaluation criteria. One study (8.3%) relating to selection of participants' bias was rated as unclear; while one study (8.3%) on confounding variables bias, was rated as high. Except for the study by

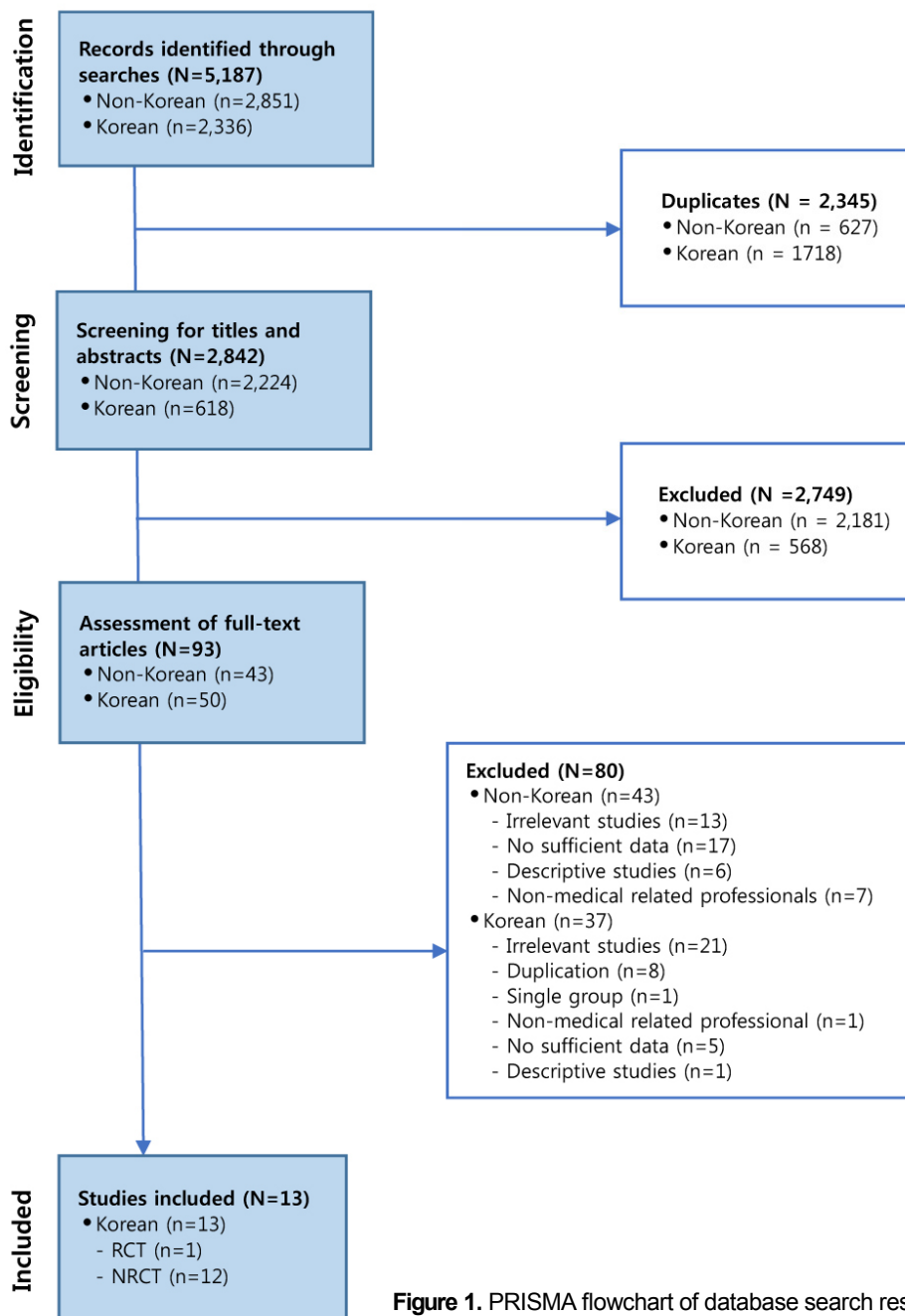


Figure 1. PRISMA flowchart of database search results.

Seo et al.(2014), all other studies were considered low risk for measurement of intervention (exposure) and incomplete outcome data bias. Four studies (33.3%) were rated as unclear and one study (8.3%) on blinding for outcome assessment bias was rated as high. All the studies (100%) were at low risk for selective outcome reporting bias.

### 3. Characteristics of Included Studies

All 13 selected studies (12 NRCTs, a RCT) were conducted in Korea, the characteristics of which are presented

in Table 2. The mean age of 10 study participants was 26.21 years. Three studies did not report mean age. The total sample size of the 13 included studies ranged from 21 to 85, with a total of 645 participants. The type of JSI-RIM used reinforced the intrinsic motivating factors through programs as follows: coaching or mentoring (n=5), self-growth related (n=4), stress management (n=2), and compassion fatigue (n=2). While, most of the studies were conducted with nurses whose employment periods were within the 5-year range, two studies were conducted with nurses

**Table 1.** Quality Assessment of Included Studies

Risk of Bias Assessment tool for Non-Randomized Studies (RoBANS)						
Author (year)	Selection of participants	Confounding variables	Measurement of intervention (exposure)	Blinding for outcome assessment	Incomplete outcome data	Selective outcome reporting
Baek et al. (2016)	Low	Low	Low	Low	Low	Low
Cho (2016)	Low	Low	Low	Low	Low	Low
Choi et al. (2016)	Low	Low	Low	Low	Low	Low
Ha et al. (2002)	Low	Low	Low	Unclear	Low	Low
Han (2019)	Low	Low	Low	Unclear	Low	Low
Jung (2015)	Low	Low	Low	Low	Low	Low
Kim et al. (2016)	Low	Low	Low	Low	Low	Low
Lee et al. (2010)	Low	High	Low	Low	Low	Low
Lee et al. (2011)	Low	Low	Low	Unclear	Low	Low
Ryu (2016)	Low	Low	Low	Unclear	Low	Low
Ryu (2018)	Low	Low	Low	Low	Low	Low
Seo et al. (2014)	Unclear	Low	High	High	High	Low

Revised Cochrane risk-of-bias tool for randomized trials (RoB 2)						
Author (year)	Randomization process	Deviations from intended interventions	Missing outcome data	Measurement of outcome data	Selection of the reported result	Overall Bias
Im et al. (2016)	Low	Low	Low	Low	Low	Low
	+	+	+	+	+	+

⊕ Low risk.

whose careers spanned more than 5 years.

#### 4. Intervention and Control Conditions

Except for one study, the other JSI-RIM (n=12) were conducted with groups in the hospital setting under the guidance of the researchers. The number of sessions varied from 4 to 12. Time per session ranged from 50-240 minutes (mean: 118 minutes) and the duration of the intervention ranged from 4 to 24 weeks. For the control groups, 12 studies were characterized by no intervention, and one study applied JSI-RIM following the posttest (Table 2).

#### 5. Outcomes

Effect sizes based on four outcome variables are shown in Figure 2. The results showed significant intervention effects on three study outcomes, excluding resilience.

- Perceived stress: The weighted average effect size (n=3) was -0.63 (95% CI [-1.14, -0.11],  $p=.02$ ,  $I^2=65\%$ ), indicating a moderate effect size.
- Self-efficacy: A significantly large effect size (n=6) was observed ( $d=-1.47$ , 95% CI [-2.37, -0.56],  $p=.001$ ,  $I^2=90\%$ ).
- Job satisfaction: The weighted average effect size (n=5) was large ( $d=-1.45$ , 95% CI [-2.42, -0.48],  $p=.003$ ,  $I^2=93\%$ ).
- Resilience: No significant effect size (n=4) was identified ( $d=-0.45$ , 95% CI [-1.24, 0.34],  $p=.26$ ,  $I^2=86\%$ ).

#### 6. Heterogeneity Assessment

The authors performed age wise subgroup analysis based on a 26-year-old group's self-efficacy and job satisfaction that showed high statistical heterogeneity ( $I^2$  range =0~98%)(Table 3). Significant effects were found on self-efficacy (n=3) between the below 26 years old group and below one ( $d=-2.30$ , 95% CI [-4.91, 0.32],  $p=.09$ ,  $I^2=96\%$ ).



**Table 2.** Descriptive Summary of Included Studies

No	Author (year)	Study design	Mean age		Subjects			Programs			Outcome measurement				
			Exp.	Cont.	Exp.	Cont.	Total	Type	Length	Session	Duration	Perceived stress	Self-efficacy	Job satisfaction	Resilience
			M	M	n	n	n		min	number	week				
1	Seo et al. (2014)	NRCT	28.10	26.53	41	44	85	SPP	50	8	8	PSS-C/W10	NR	JSS-C8	NR
2	Choi et al. (2016)	NRCT	26.86	28.14	28	28	56	RTP	120	12	4	PSS-C/K/M10	NR	NR	RS-W/Y25
3	Ha et al. (2002)	NRCT	NR	NR	25	20	45	SMP	180	9	6	PSQ-L30	NR	NR	NR
4	Jung (2015)	NRCT	23.13	23.00	24	24	48	SCP	180	6	6	NR	SES-H8	JSS-T8	NR
5	Cho (2016)	NRCT	25.10	25.78	21	18	39	CFRP	120	4	4	NR	SES-H8	NR	NR
6	Ryu (2016)	NRCT	24.1	23.90	10	11	21	HSCP	70	6	6	NR	SES-L23	NR	NR
7	Ryu (2018)	NRCT	26.80	27.73	30	30	60	ECP	150	4	4	NR	SES-H8	NR	RS-P30
8	Baek et al. (2016)	NRCT	30.87	30.70	30	30	60	CP	240	8	8	NR	SES-H8	JSS-H5	NR
9	Lee et al. (2011)	NRCT	NR	NR	23	23	46	SGTP	90	10	10	NR	SES-S23	NR	NR
10	Lee et al. (2010)	NRCT	24.95	25.18	20	22	42	MP	NR	10	24	NR	NR	JSS-T/B27	NR
11	Han (2019)	NRCT	NR	NR	31	31	62	WMP	90	8	4	NR	NR	MSQ-W20	NR
12	Kim et al. (2016)	NRCT	25.57	26.44	14	18	32	CFP	80	5	5	NR	NR	NR	ERS-K29
13	Im et al. (2016)	RCT	24.71	26.56	24	25	49	HP	NR	4	9	NR	NR	NR	ERS

Exp.=experimental group; Cont.=control group; NRCT=non-randomized controlled trials; RCT=randomized controlled trials; NR=not reported; SPP=spirituality promotion program; RTP=resilience training program; SMP=stress management program; SCP=self-coaching program; CFRP=compassion fatigue relieving program; HSCP=happiness self-coaching program; ECP=emotional coaching program; CP=coaching program; SGTP=self-growth training program; MP=mentoring program; WMP=work meaning program 1~7, 9~13; HP=huddling program; REP=releasing exercise program; PSS-C/W/10=perceived stress scale by Cohen & Williamson (10 items); PSS-C/K/M10=perceived stress scale by Cohen, Kamarck & Mermelstein (10 items); PSQ-L30=perceived stress questionnaire by Levenstein (30 items); SES-H8=self efficacy scale by Hong (8 items); SES-L23=self efficacy scale by Lee (23 items); SES-S23=self efficacy scale by Sherer (23 items); JSS-C8=job satisfaction scale by Chamiec (8 items); JSS-T8=job satisfaction scale by Tymon (8 items); JSS-H5=job satisfaction scale by Ha (5 items); JSS-T/B27=job satisfaction scale by Taylor & Bowers (27 items); MSQ-W20=minnesota satisfaction questionnaire by Weiss et al (20 items); RS-W/Y25=resilience scale by Wagnild & Young (25items); RS-P30=resilience scale by Park (30 items); ERS-K29=ego resilience scale by Klohn (29 items); ERS=ego resiliency scale by Block & Kremen (14 items); CI=confidence interval; SMD=standardized mean difference.

However, a high level of heterogeneity existed. In addition, studies that included an above 26 years old group ( $n=3$ ) showed statistical significance with a homogeneous effect on self-efficacy ( $d=-0.89$ , 95% CI [-1.21, -0.57],  $p=.001$ ,  $I^2=0\%$ ).

Although no significant effects were found on job satisfaction ( $n=2$ ) between the below 26 years old group and below one ( $d=-2.68$ , 95% CI [-7.29, 1.94],  $p=.26$ ,  $I^2=98\%$ ); the level of heterogeneity was still high. However, three studies that included the above 26 years old group showed a homogeneous effect on job satisfaction ( $\chi^2=1.37$ ,  $I^2=0\%$ ). The effect size was -0.85 (95% CI, -1.18 to -0.53) with statistical significance ( $p<.001$ ).

## DISCUSSION

### 1. Study Characteristics and Methodological Quality of JSI-RIM

A total of 13 studies were conducted to identify the effect of job satisfaction programs based on the factor of in-

trinsically motivating reinforcement. All 13 studies were conducted in Korea between 2002 and 2019, ten of which were carried out in the past five years to report on the high turnover rates of nurses (MOHWc, 2018; Cho, 2016). In addition, two meta-analyses regarding nurses' turnover intention and intention to stay through survey research have been attempted (Lee & Kang, 2018; Park & Lee, 2018). This result inevitably suggests that further studies using an RCT design for JSI-RIM are needed. Although the average program format of studies comprised 6 weeks, 8 sessions, and 114 minutes per session, it varied among the studies.

The intervention contents used in the 13 studies comprised coaching or mentoring programs ( $n=5$ ) (Baek & Jang, 2016; Jung, 2015; Lee, Park, Lee, & Hong, 2010; Ryu, 2016; Ryu, 2018), self-growth related programs ( $n=4$ ) (Choi & Kim, 2016; Han, 2019; Lee, Byun, & Jun, 2011; Seo, Yong, Park, & Kim, 2014), stress management programs ( $n=2$ ) (Ha et al., 2002; Im, Cho, Kim, & Heo, 2016), and compassion fatigue programs ( $n=2$ ) (Cho, 2016; Kim & Park, 2016). Most studies provided intrinsic motivation reinforcement through stress management or coaching, and

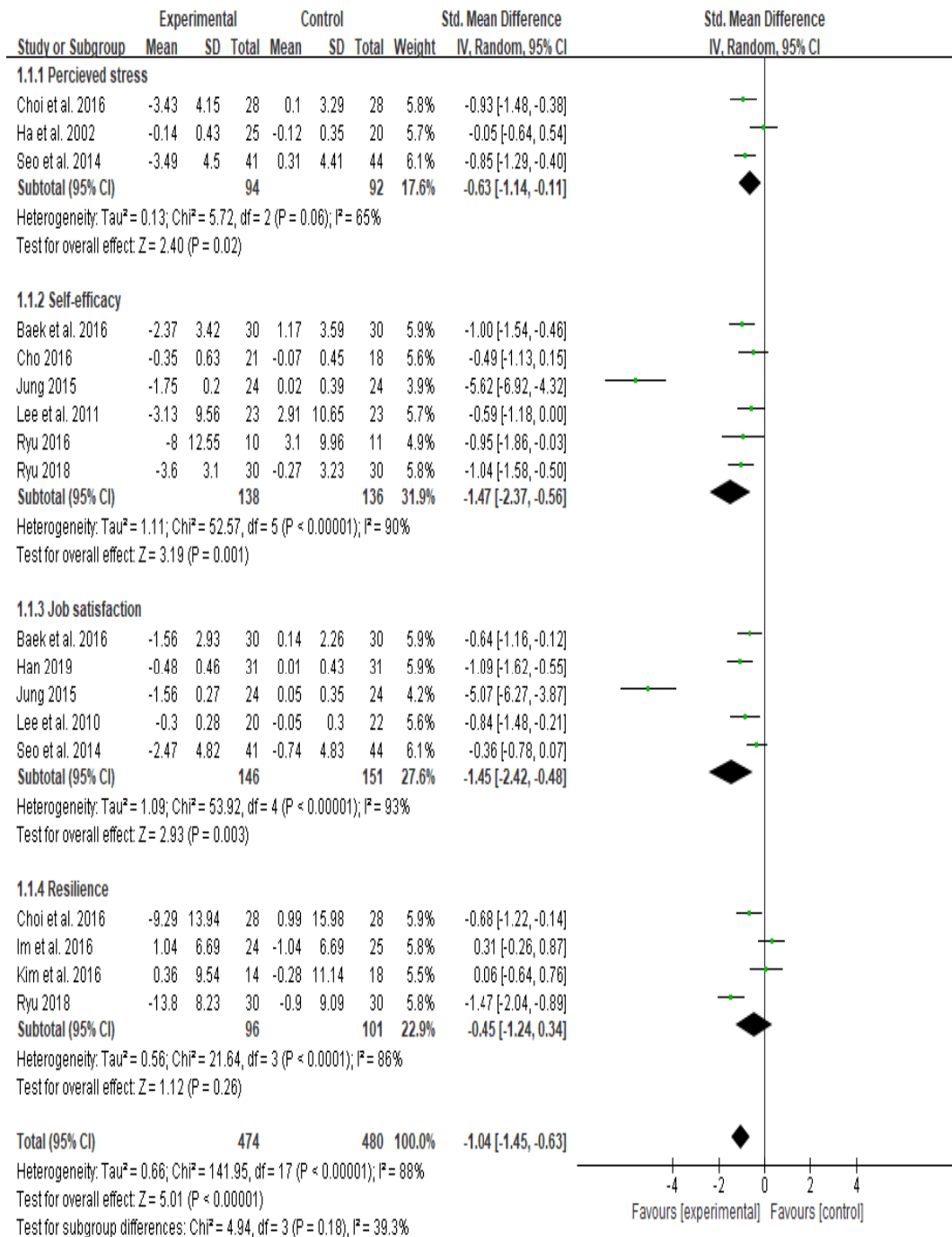


Figure 2. Forest plot: effect size of job satisfaction related interventions.

only two studies were based on discovering the meaning of work and job identity. The literature review indicates a significant statistical correlation between job satisfaction and job identity (Park & Lee, 2018), with job identity positively impacting job satisfaction (Lee et al., 2013). Moreover, nurses who discovered meaning in their work were found to experience increased joy, self-respect, produc-

tivity, work immersion (Pavlish & Hunt, 2012), and were inclined to be devoted to work along with the intention to stay on as organization members (Lee & Kang, 2018). Hence, contents relating to finding meaning in work and job identity should be included when developing educational programs for intrinsic motivation reinforcement targeted at nurses.

**Table 3.** Subgroup Analysis Job Satisfaction Related Interventions according to Age

Variables	Age	Author (year)	Experimental group		Control group		Weight (%)	SMD [95% CI]
			M±SD	Total	M±SD	Total		
Self-efficacy	< 26 years <sup>†</sup>	Cho (2016)	-0.35±0.63	21	-0.07±0.45	18	17.3	-0.49 [-1.13, 0.15]
		Jung (2015)	-1.75±0.20	24	0.02±0.39	24	13.6	-5.62 [-6.92, -4.32]
		Ryu (2016)	-8.00±12.55	10	3.10±9.96	11	15.9	-0.95 [-1.86, -0.03]
		Subtotal	-	55	-	53	46.9	-2.30 [-4.91, 0.32]
	> 26 years <sup>†</sup>	Baek et al. (2016)	-2.37±3.42	30	1.17±3.59	30	17.8	-1.00 [-1.54, -0.46]
		Lee et al. (2011)	-3.13±9.56	23	2.91±10.65	23	17.6	-0.59 [-1.18, 0.00]
Ryu (2018)		-3.60±3.10	30	-0.27±3.23	30	17.8	-1.04 [-1.58, -0.50]	
Subtotal		-	133	-	132	53.1	-0.89 [-1.21, -0.57]	
Job satisfaction	< 26 years <sup>§</sup>	Jung (2015)	-2.47±4.82	41	-0.74±4.83	44	21.3	-0.36 [-0.78, 0.07]
		Seo et al. (2014)	-1.56±0.27	24	0.05±0.35	24	16.6	-5.07 [-6.27, -3.87]
		Subtotal	-	65	-	68	37.9	-2.68 [-7.29, 1.94]
	> 26 years <sup>  </sup>	Baek et al. (2016)	-1.56±2.93	30	0.14±2.26	30	20.9	-0.64 [-1.16, -0.12]
		Han (2019)	-0.48±0.46	31	0.01±0.43	31	20.8	-1.09 [-1.62, -0.55]
		Lee et al. (2010)	-0.30±0.28	20	-0.05±0.30	22	20.3	-0.84 [-1.48, -0.21]
Subtotal	-	81	-	83	62.1	-0.85 [-1.18, -0.53]		

<sup>†</sup>Heterogeneity:  $\chi^2=48.86$ ,  $df=2$  ( $p < .001$ ),  $I^2=96\%$ , Test for overall effect:  $Z=1.72$  ( $p=.09$ ); <sup>‡</sup>Heterogeneity:  $\chi^2=1.45$ ,  $df=2$  ( $p=.48$ ),  $I^2=0\%$ , Test for overall effect:  $Z=5.44$  ( $p=.001$ ); <sup>§</sup>Heterogeneity:  $\chi^2=52.53$ ,  $df=1$  ( $p < .001$ ),  $I^2=98\%$ , Test for overall effect:  $Z=1.14$  ( $p=.26$ ); <sup>||</sup>Heterogeneity:  $\chi^2=1.37$ ,  $df=2$  ( $p=.50$ ),  $I^2=0\%$ , Test for overall effect:  $Z=5.20$  ( $p < .001$ ).

The outcome variables of studies included in this meta-analysis criteria were: self-efficacy ( $n=7$ ), job satisfaction ( $n=5$ ), perceived stress ( $n=5$ ), and resilience ( $n=4$ ). Park and Lee (2018) segregated factors that influenced hospital nurses' intentions of retaining their jobs into five areas: nursing work performance, nursing work environment, behavior toward nursing (job satisfaction and organizational commitment), nurses' psychological resources (self-efficacy and self-leadership), and nursing values (self-concept and profession). Among these, job intention showed a high score when the job satisfaction score was high. Further, the job intention score was correlated with the organizational commitment score, especially when there was a high devotion score (one of the sub-factors of organizational commitment). In addition to high organizational commitment and work-related stress, autonomy and vocational behavior toward nursing and allied values, self-efficacy, and self-leadership had a correlation with job intention scores. Furthermore, according to Ko and Kang (2015), meaning of work and career commitment had an absolute mediating impact on the relationship between vocation and job satisfaction. To compare the above results and this study, educational programs included in this meta-analysis only partially dealt with the influencing factors of nurses' intentions of retaining their jobs, and in only two of the studies, the programs dealt with variables like job identity or the meaning of work (Han, 2019; Jung, 2015). Since the goal of job satisfaction is to increase the intention of job

retention, contents relating to meaning of work and job identity should be incorporated into educational programs and measurement variables.

Of the 13 studies evaluated, only one was RCT, and methodological quality evaluation found this RCT study to be 'low' in the six bias criteria. Of the 12 NRCT studies, 5 (41.6%) lacked clarification on blinding, especially on the section of 'Blinding for outcome assessment.' It is fair to surmise that there could have been limitations on blinding since both the subjects and the therapists knew whether the subjects were in the control or experimental groups because of the characteristics of most psychological interventions. Each of these studies was rated as 'high risk' in 'confounding variables', 'measurement of intervention (exposure)', and 'incomplete outcome data.' Concerning analysis of future psychological interventions, the use of intervention manuals, monitoring of subjects closely during the intervention, concreteness of the variables of the initial results, and homogeneity of major variables between subjects during the intervention should be taken into account.

## 2. Effect Size of Outcome Variables

The forest plot depicts the combined analysis results of the 13 studies. The mean of the pre-post values between the two groups, sample sizes, and standard deviations of outcomes were used for computation of standardized mean differences (SMD). The random-effect model was



applied to compute all the studies' mean effect sizes due to differences in each study's design and contents.

In this study, JSI-RIM showed moderate effect size in reducing the nurses' perceived stress ( $d=-0.63$ ). Three of the 13 reviewed studies were included and the test of heterogeneity was found to be moderate ( $I^2=65\%$ ). This result supports a study conducted by Park and Lee (2018) on influencing factors of retaining hospital nurses' job intention which stated that work-related stress has a negative correlation with job intention. However, of the 13 studies, only three were included in this meta-analysis. In Lee et al. (2010) study, job stress was not significantly related to turnover intention-related factors, hence the need to perform future studies that would reflect perceived stress as an outcome variable. Moreover, since these three studies used different measuring scales, future studies could gain advantages in comparative analysis and generalization by referring to the scales that this study investigated (Table 1).

Self-efficacy had a significant effect in six of the 13 studies. Although JSI-RIM had the largest effect size in enhancement of self-efficacy ( $d=-1.47$ ), the resultant heterogeneity was high ( $I^2=90\%$ ). The heterogeneity test is performed to measure the degree of inconsistency among included studies (Oh, Jeon, & Koh, 2015). It is reasonable to state that it showed high heterogeneity since a value greater than  $I^2=75\%$  is considered to be high as indicated in a study conducted by Higgins et al (2019). Since the variable of self-efficacy is closely connected with clinical experience, subgroup analysis was performed between the nurses recruited immediately after graduation and those aged above 26 years, thus setting the standard of three or more years of experience. The subgroup analysis results showed no significant changes in heterogeneity to the under 26 years ( $I^2=96\%$ ). However, it showed a significant relationship with a homogeneous effect on the above 26 years ( $I^2=0\%$ ). The previously conducted meta-analysis on related factors of nurses' turnover intentions factoring ecosystemic aspects (Lee et al., 2010) reported that self-efficacy was not one of the influencing factors since for personal factors it had a small effect size ( $ES=0.14$ ) and also showed no correlation with clinical experience. Thus, there is a need for further study with careful interpretation.

In this study, JSI-RIM showed a significant effect on job satisfaction ( $d=-1.45$ ). Although a direct comparison cannot be made since no previous meta-analyses were conducted for the effects of JSI-RIM, previous meta-analysis results on influencing factors of job and turnover intentions supports this study's results with the evidence of job satisfaction showing a large effect size with a high correlation (Lee et al., 2010; Park & Lee, 2018). Conversely,

there was high heterogeneity ( $I^2=93\%$ ). With respect to the result of subgroup analysis between the two groups, the below 26 years group showed high heterogeneity ( $I^2=98\%$ ), whereas the above 26 years group showed homogeneity ( $I^2=0\%$ ) in three studies. Newly recruited nurses' job satisfaction related factors were reported as emotional labor, ward-working environment, organizational culture, and work overload (Heinen et al., 2013). A recent investigation on turnover intentions of 23,076 nurses in 384 hospitals in ten European countries reported almost no difference between the countries but large differences between the departments (Leineweber et al., 2016). This result shows that just as intrinsic motivation has a close relationship with job satisfaction, similarly, relationship with organization members, nursing organization culture, and workplace bullying also has an important effect on nurses' satisfaction with their work.

Since four studies that measured resilience as an outcome variable had no significant effect size; further verification will be necessary through further studies. In the two studies that showed significant differences in pre-post mean value, educational contents related to resilience were considered as important in more than two sections (Choi & Kim, 2016; Ryu, 2018). However, the other two studies had no significant changes (Kim & Park, 2016; Im et al., 2016).

### 3. Limitations

Research on JSI-RIM conducted in countries other than Korea was not confirmed by the search terms applied in this study. Thus, further research needs to be conducted in order to increase the applicability of the findings. As the program's effect was measured only once, after completion, the failure to consider the long-term effect of nurses' job satisfaction is a limitation. Five of the 12 NRCT studies not meeting the blinding qualification in quality assessment is another limitation of psycho-social research. Moreover, an analysis of the 13 studies has revealed the necessity of including concrete intrinsic factors like the meaning of work in the program contents and using a detailed scale for their measurement.

### 4. Implication for Nursing Practice and Management

Retaining nurses and stable manpower supply is crucial for guaranteeing quality patient care. Nurses' job satisfaction levels can be attributed to people's health promotion since nursing is a profession that can greatly impact out-

comes such as patients' deaths, complications, and infections (Choi & Kim, 2016; MOHWc, 2018). The meta-analysis confirmed that job satisfaction interventions that reinforce intrinsic motivating factors have significant effects in increasing self-efficacy, improving job satisfaction, and reducing perceived stress. It can, therefore, be stated with certainty that this study has generated scientific evidence that would facilitate efficient job adaptation for hospital nurses.

## CONCLUSION

This is the first study to attempt a meta-analysis on the effects of JSI-RIM for hospital nurses. The meta-analysis informed that these interventions significantly improved self-efficacy and job satisfaction, as well as reduced perceived stress. Previous studies reviewed in this meta-analysis revealed that most of the job satisfaction interventions identified for hospital nurses were focused in competence reinforcement, and only 13 studies included intrinsic motivation reinforcement programs. Additionally, intrinsic factors such as job identity and meaning of work needs to be included in JSI-RIM. The evidence from this study can efficiently be used for improving hospital nurses' job satisfaction.

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