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Systematic Review

Factors Associated with the Emotional Intelligence Levels of Nurse Managers: A Systematic Review and Meta-Analysis

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Abstract

AIM: The purpose of this study is to determine the emotional intelligence levels of nurse managers and the factors associated with these levels.
METHOD: In this systematic review and meta-analysis, searches were made on the PubMed, EMBASE (OVID), CINAHL (EBSCO), Web of Science, Ulusal Tez Merkezi, Türk Medline, and DergiPark search engines between December 7, 2020, and January 30, 2021, using the key phrases "nurse AND ("manager" OR "nurse manager" OR "administration") AND "emotional intelligence." In this study, the publications were reviewed in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guide checklist.
RESULTS: The emotional intelligence levels of nurse managers are affected by some personal and institutional factors. Emotional intelligence is important in nurse managers. This study included 21 cross-sectional studies published between 2010 and 2020. In this study, it was concluded that the mean synthesized emotional intelligence level of nurse managers was 105.734±8.826, 18 variables about nurse managers and 2 variables about institutions/employees increased emotional intelligence levels, 2 variables about nurse managers and one variable about institutions/employees reduced emotional intelligence levels, and 14 variables about nurse managers and 5 variables about institutions/employees did not affect emotional intelligence levels.
CONCLUSION: In this study, it was established that the emotional intelligence levels of nurse managers are influenced by several individual, institutional, and employee-related variables. By considering these variables in the selection of nurse managers, the improvement of their individual success levels, and the evaluation of these levels, the quality and cost-effectiveness of health services can be improved.
Keywords: Emotional intelligence, nurse manager, nursing

Introduction

Nurse managers intensively interact with not only the individuals to whom they provide services but also the team they are working with. For these nurses to communicate well and effectively and maintain this level of communication, they need to have empathy and be able to motivate themselves and their employees. It is also important for nurse managers to have the capacity to recognize and manage the emotions of their own and those of the nurses they work with. Emotional intelligence (EI) refers to the person's ability to feel, perceive, and define their own emotions and the emotions of others; manage emotions; and use all these in their behaviors and thoughts (Goleman, 1995; Salovey & Mayer, 1990).

George (2000) emphasized that emotions have a central role in the leadership process. They also proposed the idea that there are five main components of leader effectiveness, such as the development of collective goals and objectives, instilling in others an appreciation of the importance of work activities, generating and maintaining enthusiasm, confidence, optimism, cooperation, and trust, encouraging flexibility in decision-making and change, and establishing and maintaining a meaningful identity for an organization, and that these components are associated with the level of EI. Due to the nature of leadership, the quality of the leader–member relationship is also improved through the EI of the leader (Dasborough & Ashkanasy, 2002).

In nursing care services, there is a need for nurse managers who have high levels of EI to be able to gather employees with different characteristics around a common point, make effective decisions, and use labor efficiently. Previous studies have revealed that EI can make a difference in organizations in terms of fields such as leadership, interpersonal communication, teamwork, and creativity (Van Dusseldorp et al., 2011; Spano-Szekely & Quinn Griffin, 2016; Tyczkowski et al., 2015). Likewise, the EI levels of managers affect the satisfaction of patients and employees, current job performance, service quality, cost, and the burnout levels of employees (Coladonato & Mannig, 2017; Munro, 2011; Sulukaya, 2012). However, it is observed that in many countries and health-care institutions, EI is not taken into consideration in the selection of nurse executives and management performance (Freshman & Rubino, 2002). Most studies in the literature have evaluated the EI levels of nurse executives using a variety of scales. In addition, the impact of many factors on EI levels has been examined. With this study, it was aimed

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to determine the EI levels of nurse executives and factors that were not related with the EI level as well as the factors that did not affect the EIe level in a positive and negative direction by synthesizing the results of the studies in the literature.

Research Questions

1. What are the EI levels of nurse managers?
2. What are the factors that are positively or negatively related to the EI levels of nurse managers?
3. What are the factors that are unrelated to the EI levels of nurse managers?

Method

Study Design

This study employed a systematic review and meta-analysis design. In the preparation of the research protocol and the writing of the article, the PRISMA Statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) was utilized (Moher et al., 2009).

Search Strategy

To reduce potential biases that could arise in this systematic review, the processes of literature search, article selection, data extraction, and quality assessment of the articles were carried out independently by two different researchers, and a consensus was reached afterward through discussions held in meetings with the participation of another expert researcher. In this study, searches were made on the PubMed, EMBASE (OVID), CINAHL (EBSCO), Web of Science, Ulusal Tez Merkezi, Türk Medline, and DergiPark search engines between December 7, 2020, and January 30, 2021. The key phrases "nurse AND ("manager" OR "nurse manager" OR "administration") AND "emotional intelligence" were used in the searches. The complete search strategy on the PubMed was in the form of ("nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields]) AND ("manager"[All Fields] OR "nurse manager"[All Fields] OR ("organization and administration"[MeSH Terms] OR ("organization"[All Fields] AND "administration"[All Fields]) OR "organization and administration"[All Fields] OR "administration"[All Fields])) AND "emotional intelligence"[All Fields]. To access additional studies that could be relevant, the reference lists of the included studies and review studies about the topic were examined.

Study Selection

To reduce potential biases that could arise in this sysmatic review, the processes of literatüre search, article selection, data extraction, and quality assessment of the articles weew articles were carried out independently by two different researchers, and a consensus was reached afterward through discussions held in meetings with the participation of another expert researcher. The selection of studies was carried out independently by the authors of this study. Repeated entries were removed from the records obtained as a result of the searches, and studies were selected based on their title, abstract, and full text in this order. Whenever there was a difference in opinion about a study considered for inclusion, a consensus was reached by holding discussions in meetings in the presence of another expert researcher. Data retrieval is a stage in which necessary information about findings and variables of the studies included is obtained. Since the subject, purposes, and questions of every compilation will be different, necessary data will also be different (Karacam, 2013). Therefore, the data to be used in the study was acquired using a data retrieval tool that was created by the researchers. This tool collected data related to the authors, publication year, data collection years, and countries of research, as well as research design, data collection tools, field of study, sample size, age characteristics of the sample, EI scores of the nurse executives, and situations concerning EI scores. This stage of the study was conducted independently by two researchers. The researchers checked and transformed it into a single text in a session. When data differences were determined, the authors rechecked the relevant study and arrived at a consensus through discussion.

Inclusion and Exclusion Criteria

For this systematic review, studies that have examined the EI levels of nurse managers and associated factors were selected. The studies that were suitable for this review had to meet the PEOS criteria:

P: Patients/Population: Nurse managers.

E: Exposure: EI levels.

O: Outcomes: EI levels, effective factors (e.g., age, education level, work experience, gender, duration of work, field of work).

S: Study design: Cross-sectional studies published in Turkish or English in the period of 2010–2020.

The excluded categories were reviews, case reports, qualitative studies, and conference presentations.

Quality Appraisal

The assessment of the methodological quality of the articles that were included in this systematic review was made based on theJoanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross Sectional Studies (). This checklist includes eight items, and these items have the response options of "yes, no, unclear, not applicable." The methodological quality levels were determined as follows: the quality level was considered mediocre if fewer than 50% of the items were marked as "yes," moderate if 51–80% of the items were marked as "yes," and high if more than 80% of the items were marked as "yes." These methodological quality levels were determined independently by the two researchers, and a single assessment text was generated in a meeting with the participation of another expert researcher. No study was excluded as a result of the methodological quality assessment. All selected articles are suitable for the purpose of the study.

Data Synthesis

The quantitative data of the study were synthesized with the method of meta-analysis, while the qualitative data were synthesized with the narrative synthesis method. The EI scores of nurse managers obtained from the included studies were synthesized by calculating the 95% CI and the standardized

mean difference. The narrative synthesis method was used in the synthesis of the data about the factors associated with EI. The meta-analyses of the study were carried out using the Comprehensive Meta-Analysis Version 3—Free Trial (https://www.meta-analysis.com/pages/demo.php) program. The heterogeneity among the studies was evaluated using Cochran's Q test and Higgins I^2, and I^2 values of higher than 50% indicated that the heterogeneity was significant. Random effect results were obtained in the case that I^2 was higher than 50%, while fixed effect results were obtained in the case that it was lower than 50%. All tests were carried out with two-tailed calculations, and $p < .05$ was considered statistically significant. For data collection tools, standardized mean difference was calculated by considering heterogeneity (Tufanaru et al., 2020).

Results

Search Results

As a result of the searches made on the databases, 1818 records were reached in total. After the removal of the repeated records and the assessment of the titles and abstracts, 104 studies were determined to examine their full texts. After the examination of the full texts based on the inclusion criteria of the study, 21 studies were included in the systematic review (Figure 1) (Page et al., 2021).

Study Characteristics

All 21 studies that were included in this systematic review were cross-sectional studies. However, the research design in some studies was presented using different concepts such as descriptive study or correlational study. The total sample size of all studies consisted of 2619 nurse managers, and the sample sizes varied between 20 and 349. The minimum age of the nurse managers in the samples was 20. Among the examined studies, the samples of two studies included specialized nurses such as training, infection, and quality assurance nurses in addition to nurse managers. Nine of the studies were conducted in the USA, seven were conducted in Turkey, and one study was conducted in each of the countries of Iran, Japan, Egypt, Jordan, and Southern Africa. The data were collected between 2007 and 2019 in 11 of the studies. Data collection dates were not reported in the remaining 10 studies. The data of the studies were collected using 12 different data collection instruments including. Eighteen of the included studies reported the mean EI scores of nurse managers, while 20 reported the factors associated with EI levels (Table 1).

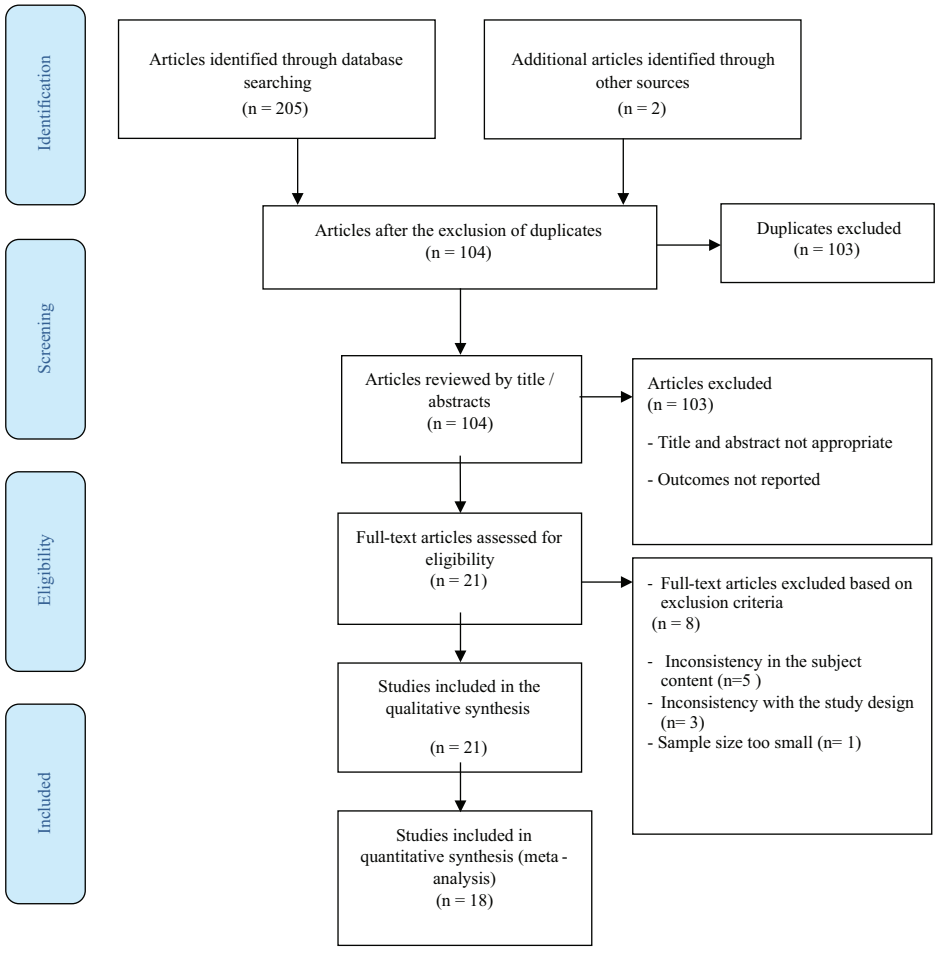


Figure 1.
PRISMA Flowchart for Study Selection. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Table 1.
Characteristics and Results of Studies That Were Included in the Systematic Review

Author(s), Year/Country	Study Design	Data Collection Tools	Field of Study	Sample Size	Mean Sample Age, in Years (SD)	Time of Data Collection	Mean EI Scores	Associated Factors
Aksu, 2010/ Turkey	Descriptive	MSEIS	Hospital	173	39.08 ± 6.30	2010	152.26 ± 11.88	Weak positive relationship with leadership behaviors.
Bikmoradi et al., 2018/Iran	Cross-sectional	Bradbury's emotional intelligence questionnaire	Hospital	349	41 ± 5.1	2016	80.46 ± 6.7 (50–95)	Positive significant relationship with gender, age, marital status, number of children, work experience, administrative work experience, and job and life satisfaction; no relationship with experiencing work-related problems, education levels, or income levels.
Boivin, 2013/USA	Cross-sectional	MSCEIT	Care center	36	47 ± 10.13	–	–	No significant relationship with years of work at the institution or organizational commitment scores.
Coladonato and Mannig, 2017/ USA	Cross-sectional	Bar-on EQ-i 2.0	Hospital	20	35–69	–	104.76 ± 10.549 (90–110)	Strong correlation between the self-management dimension of the scale and the variables of job satisfaction, managerial skills, and employee support.
Colhan, 2016/ Turkey	Descriptive	Duygusal Zeka Degerlendirme Olcegi	Hospital	95	35.56 ± 5.88 (25–51)	2016	151.26 ± 19.23 (47.00–176.00)	No significant relationship with marital status; education level; position at the institution; or participation in in-service training, courses, or seminars.
Echevarria et al., 2017/USA	Predictive correlational	Genos Inventory	Care center	148	48.86 ± 8.75 (30–68)	-	--	Weak, positive and significant relationship with transformational leadership, age, leadership experience, and years of working as RN; higher EI levels in male nurse managers.
Hamdan et al., 2018/Jordan	Cross-Sectional	Genos Inventory	Hospital	248	26–30	2016–2017	3.63 ± 0.49 (2.00–5.00)	Positive relationship with the integrating style among conflict-solving styles; negative relationship with compromising, obliging, dominating, and avoiding styles.
Hirai and Yoshiok 2020/Japan	Descriptive	EQS	Hospital	105	51.7 ± 5.9	2018–2019	223.29 ± 1.30	-
Kabeel, 2016/ Egypt	Descriptive correlation	WLEIS	Hospital	48	34.08 ± 1.05	–	49.83 ± 5.59	Positive relationship with transformational leadership, education, and administrative experience.
Munro, 2011/USA	Cross-sectional	MSCEIT	Hospital	38	51.27 ± 6.32 (28–64)	–	102.97 ± 13.80 (75–133)	No significant relationship with the job satisfaction of nurses at the institution or patient care outcomes related to patient satisfaction.

(*Continued*)

Table 1.
Characteristics and Results of Studies That Were Included in the Systematic Review (Continued)

Author(s), Year/Country	Study Design	Data Collection Tools	Field of Study	Sample Size	Mean Sample Age, in Years (SD)	Time of Data Collection	Mean EI Scores	Associated Factors
Ohlson and Anderson, 2014/ USA	Quantitative	MSCEIT	Hospital	87	50.8 ± 7.7	–	98.1 ± 13.1	Emotional intelligence scores of nurses with expertise certificates are higher than that of those without certificates.
Ozduyan Ozduyan Kilic, 2018/Turkey	Cross-sectional	MSEIS	Hospital	197	39.9 ± 5.9 (27–59)	2017	88.46 ± 7.74 (72–106)	No significant relationship with hospital type, age, education level, experience in the profession, years of working at current hospital, years of working as service supervisor nurse (SSN), or years of working as SSN at current hospital.
Prufeta, 2017/ USA	Descriptive	MSCEIT	Hospital	38	(25–64)	–	96.65 ± 15.11	Higher EI scores in women, those with graduate-level education and those with 3–5 years of experience, increasing along with age.
Sobas-Gonzalez, 2013/USA	Quantitative	MSCEIT	Care center	31	41 ± 7.93 (29–55)	–	57.25 ± 26.4 (31–84)	No significant relationship with the job satisfaction of employees or years of work.
Spano-Szekely and Quinn Griffin, 2016/USA	Descriptive	TEIQue-SF	Hospital	148	(20–60)	2014	170 ± 16.10	Positive relationship with transformational leadership.
Sulukaya, 2012/ Turkey	Correlational	ESCI (Goleman)	Hospital	43	–	2012	–	Negative relationship with the burnout levels of employees.
Tiryaki Sen et al., 2013/Turkey	Descriptive	DZO	Hospital	52	(31–41)	2011–2012	4.16 ± 0.34	No significant relationship with age, marital status, experience in the profession, or years of working in an administrative position. Higher EI among those with higher education levels.
Tyczkowski et al., 2015/USA	Descriptive	Bar-on EQ-i 2.0	Care center	146	–	–	107.76 ± 11.29 (74–132)	Positive relationship with transformational leadership; no relationship with noninterventionist (laissez-faire) leadership.
Uzuner, 2012/ Turkey	Descriptive	Bar-on EQ	Hospital	200	(17–47)	2011–2012	325.25 ± 33.67 (230–406)	Relationship with older age, higher education levels, job position, and status of reacting to mobbing; no relationship with marital status or years of work. Reduced frequency of subjugation behaviors with increased EI levels.

(*Continued*)

Table 1.
Characteristics and Results of Studies That Were Included in the Systematic Review (Continued)

Author(s), Year/Country	Study Design	Data Collection Tools	Field of Study	Sample Size	Mean Sample Age, in Years (SD)	Time of Data Collection	Mean EI Scores	Associated Factors
Yılmaz Kusakli and Bahcecik, 2012/Turkey	Descriptive	Bar-on EQ	Hospital	258	34.44 ± 6.58	2007	3.92 ± 0.32 (2.98–4.73)	Positive relationship with leadership behaviors, relationship with age, marital status, educational status, status of having received managerial training, and status of having received conflict management training; no significant relationship with having received training on leadership, communication, stress management, teamwork or motivation.
Zyl et al., 2017/ Southern Africa	Descriptive	EQI	Hospital	159	–	–	83.30 ± 39.07	No significant relationship with work stress; significant negative relationship with self-leadership.

Note: EI = Emotional intelligence; ESCI = Emotional and Social Competency Inventory; MSEIS = Modified Schutte Emotional Intelligence Scale; Bar-on EQ-i 2.0 = Bar-on model of emotional intelligence EQ-i 2.0; Genos Inventory = Genos Emotional Intelligence Inventory; EQS = Emotional Intelligence Scale; WLEIS = Wong and Law Emotional Intelligence Scale; MSCEIT = Mayer–Salovey–Caruso Emotional Intelligence Tool; TEIQue-SF = Trait Emotional Intelligence Questionnaire—Short Form; DZO = Duygusal Zeka Olcegi [Emotional Intelligence Scale]; EQI = Emotional Intelligence Index; Y = Yes; N = No.

Quality Assessment Results

In the assessment made using the checklist published by the JBI, it was determined that 20 of the studies had "high quality," while one had "moderate quality" (Table 2).

Synthesis Results

Meta-Analysis Results on Emotional Intelligence Scores

Eighteen of the studies that were included in the systematic review reported EI mean scores (Aksu, 2010; Bikmoradi et al., 2018; Coladonato & Mannig, 2017; Colhan, 2016; Hamdan et al., 2018; Hirai & Yoshiok, 2020; Kabeel, 2016; Munro, 2011; Ohlson & Anderson, 2014; Ozduyan Kilic, 2018; Prufeta, 2017; Sobas-Gonzalez, 2013; Spano-Szekely & Quinn Griffin, 2016; Tiryaki Sen et al., 2013; Tyczkowski et al., 2015; Uzuner, 2012; Yılmaz Kusakli & Bahcecik, 2012; Zyl et al., 2017). According to the synthesized results of these studies, the mean EI score of their participants was determined as 105.734 ± 8.826 (95% CI: 88.436–123.031; *z*: 11.980, $p < .001$; I^2: 99.999. In this meta-analysis set, the publication bias among the included studies was not found to be statistically significant (*t*: 1.65; *df*: 16; *p*: .118) (Figure 2).

Narrative Findings of the Variables Related and Not Related with Emotional Intelligence Score

All studies that were included in this systematic review reported some variables that increased, reduced, and did not affect EI. Since the variables had no numeric values, they were expressed using a narrative style. In the synthesis, it was found that 18 variables (leadership behaviors, job satisfaction, education, etc.) about nurse managers and two variables (employee support and patient satisfaction) about institutions/employees increased EI levels, two variables (self-leadership and conflict solving with integrating) about nurse managers, and one variable (high burnout levels of employees) about institutions/employees reduced EI levels, and 14 variables (experiencing work-related problems, being an immigrant, marital status, etc.) about nurse managers and five variables about institutions/employees did not affect EI levels (Table 3).

Discussion

This study was carried out with a systematic review and meta-analysis design to determine the EI levels of nurse managers and associated factors. The EI levels of nurse managers were identified by synthesizing the mean scores obtained with different measurement instruments used in the included studies. In this systematic review, it was found that the EI levels of nurse managers are affected by many individual, team-related, and institutional factors. This information is valuable in terms of revealing comprehensive data about the EI levels of nurse managers in different countries and environments, as well as associated factors.

In this study, the EI levels of nurse managers were calculated based on previous studies. Because there were differences between the maximum and minimum scores of the different scales used in the reviewed studies, and these scales did not have cutoff values, tangible information could not be obtained about the EI levels of nurse managers. Based on this result, it is

Table 2.
Quality Assessment Results of Studies Included in the Systematic Review

	JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies								
Included Studies	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Quality Score**
Aksu, 2010	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Bikmoradi et al., 2018	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Boivin, 2013	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Coladonato & Mannig, 2017	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Colhan, 2016	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Echevarria et al., 2017	Y	Y	Y	Y	Y	Y	Y	Y	High (100%)
Hamdan et al., 2018	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Hirai & Yoshiok, 2020	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Kabeel, 2016	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Munro, 2011	Y	Y	Y	Y	Y	Y	Y	Y	High (100%)
Ohlson & Anderson, 2014	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Ozduyan Ozduyan Kilic, 2018	Y	Y	Y	Y	Y	Y	Y	Y	High (100%)
Prufeta, 2017	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Sobas-Gonzalez, 2013	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Spano-Szekely & Quinn Griffin, 2016	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Sulukaya, 2012	Y	Y	Y	Y	Y	Y	Y	Y	High (100%)
Tiryaki Sen et al., 2013	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Tyczkowski et al., 2015	N	N	Y	Y	Y	N	Y	Y	Moderate (62.5%)
Uzuner, 2012	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Yılmaz Kusakli & Bahcecik, 2012	Y	Y	Y	Y	Y	N	Y	Y	High (87.5%)
Zyl et al., 2017	Y	Y	Y	Y	Y	Y	Y	Y	High (100%)
TOTAL (%)	95%	95%	100%	100%	100%	24%	100%	100%	

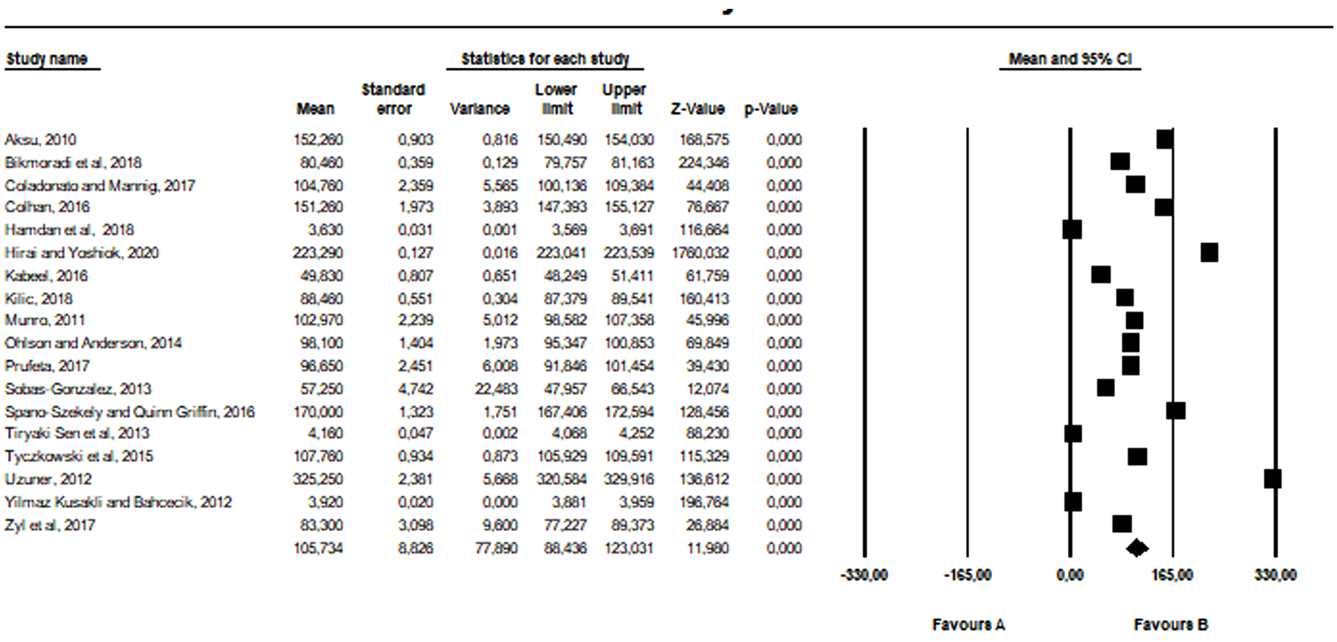
Note: JBI = Joanna Briggs Institute; Y = Yes; N = No.

believed that studies that determine the EI levels of nurse managers by considering this issue are needed.

Gender factor: This systematic review included studies that reported higher EI levels in favor of male nurse managers, as well as those that reported higher levels in favor of female nurse managers. Some similar studies in the literature conducted with health-care workers and nurses have reported no significant difference in EI levels based on gender (Balcı Suslu, 2016; Saeidet al., 2013; Saygın, 2015; Seymen, 2019). Pérez-Fuentes et al. (2018) reported that women had higher EI levels than men in terms of the interpersonal and intrinsic components of EI. In some other studies, it has been stated that male nurses have higher EI scores than female nurses in terms of the intrinsic components of EI, stress management, and adaptability (Azimi et al, 2010; Gerits et al, 2004). In a general sense, these results may collectively indicate that there is no relationship between EI and gender.

Age factor: In this study, studies reporting that EI increases as nurse managers get older and those reporting no such effect of age were identified. Similar studies have reported similarly that age does not influence the EI scores of nurses (Akbolat & Isık, 2015; Balcı Suslu, 2016; Ismen, 2001). Mayer et al. (2004) and Nancy (2001) found increases in EI scores in parallel with increasing age. Similarly, Orsal (2014) determined a positive relationship between the ages of health-care administrators and their EI in the empathy and awareness categories. It is expected that as the interpersonal and work-related experiences of individuals increase with age, their job adjustment will increase in parallel, and their skills of understanding and managing the emotions of individuals will be improved.

Education level factor: Among some studies included in this systematic review, it was seen that increased education levels of nurse managers corresponded to higher EI scores, while there were other studies that reported no significant effect of education levels on EI scores. Other studies in the literature have also reported no such effect of education levels in EI scores (Balcı Suslu, 2016; Orsal, 2014). A study that was performed with health-care workers revealed that the EI scores of health-care workers who were graduates of associate and undergraduate programs were higher than those among health-care workers who were high school graduates (Saygın, 2015). In a study conducted with firm managers, it was reported that as the education levels of managers increased, their scores in the context



Model	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared	Tau Squared	Standard Error	Variance	Tau
Fixed	18	7,591	0,016	0,000	7,560	7,622	484,966	0,000	3096659,04	17	0,000	99,999	1398,448	1463,710	2142446,65	37,396
Random	18	105,734	8,826	77,890	88,436	123,031	11,980	0,000								

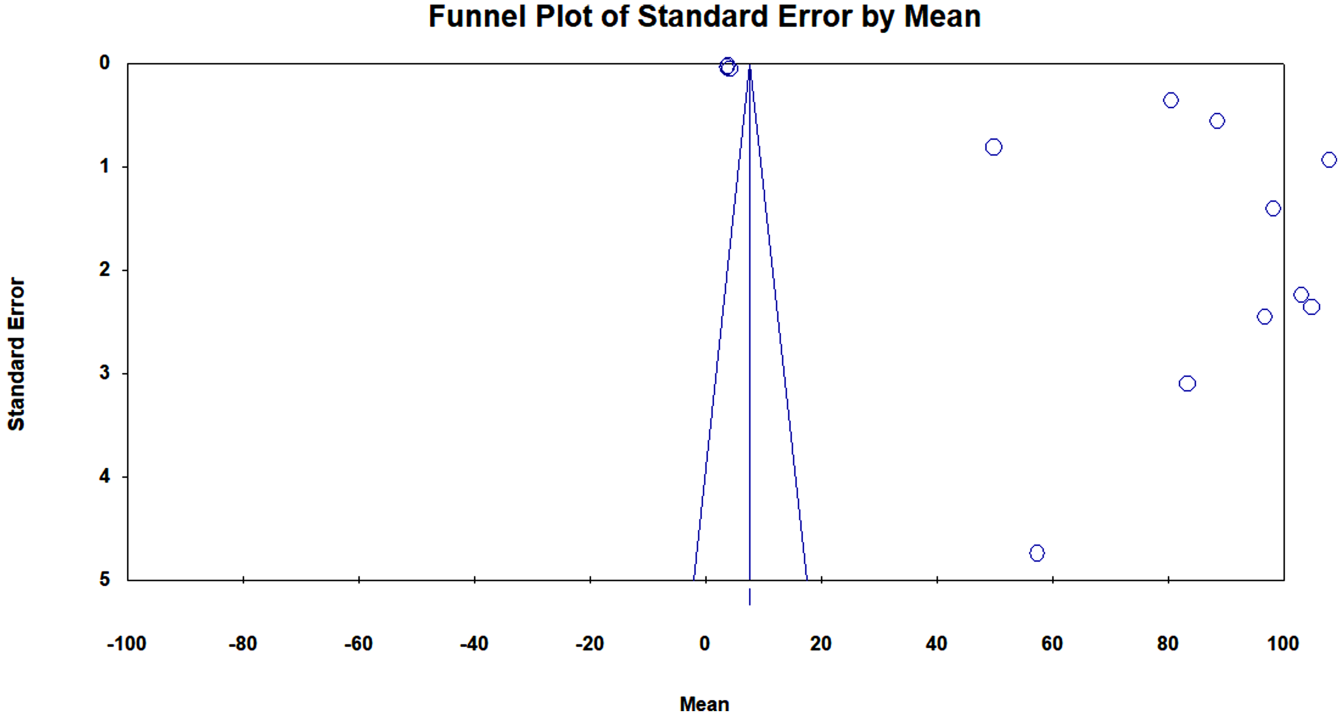


Figure 2.
Meta-Analysis.

Table 3.
Variables Associated with Emotional Intelligence

Effect		Variables and References		
Variables increasing emotional intelligence	Related to the nurse manager	Leadership behaviors (Aksu, 2010; Yılmaz Kusakli & Bahcecik, 2012) Job satisfaction (Coladonato & Mannig, 2017) Managerial skills (Coladonato & Mannig, 2017) Transformational leadership (Echevarria et al., 2017; Kabeel, 2016; Spano-Szekely & Quinn Griffin, 2016; Tyczkowski et al., 2015) Leadership experience (Echevarria et al., 2017; Kabeel, 2016) Years of work (Echevarria et al., 2017)	Being male (Echevarria et al., 2017) Integrating style of conflict solving (Hamdan et al., 2018) Education (Kabeel, 2016; Prufeta, 2017; Tiryaki Sen et al., 2013; Uzuner, 2012; Yılmaz Kusakli & Bahcecik, 2012) Expertise certificate (Ohlson & Anderson, 2014) Being female (Prufeta, 2017) Age (Prufeta, 2017; Uzuner, 2012; Yılmaz Kusakli & Bahcecik,2012)	Reacting to mobbing (Uzuner, 2012) Lower frequency of subjugation behaviors (Assertiveness, Initiative) (Uzuner, 2012) Marital status (Being single) (Yılmaz Kusakli & Bahcecik, 2012) Receiving managerial training (Yılmaz Kusakli & Bahcecik, 2012) Receiving conflict management training (Yılmaz Kusakli & Bahcecik, 2012) Job position (Uzuner, 2012)
	Related to the institution and employees	Employee support (Coladonato & Mannig, 2017) Patient satisfaction (Munro, 2011)		
Variables reducing emot	Related to the nurse manager	Conflict solving with integrating, obliging, dominating, and avoiding styles (Hamdan et al., 2018) Self-leadership (Zyl et al., 2017)		
	Related to the institution and employees	High burnout levels of employees (Sulukaya, 2012)		
Variables that are not effective	Related to the nurse manager	Experiencing work-related problems (Bikmoradi et al., 2018) Being an immigrant (Bikmoradi et al., 2018) Education level (Bikmoradi et al., 2018; Colhan, 2016; Ozduyan Kilic, 2018) Income level (Bikmoradi et al., 2018) Marital status (Colhan, 2016; Tiryaki Sen et al., 2013; Uzuner, 2012) Position at the institution (Colhan, 2016)	In-service training, courses, seminars (e.g., leadership, communication, stress management, teamwork, motivation) (Colhan, 2016; Yılmaz Kusakli & Bahcecik,2012 Age (Ozduyan Kilic, 2018; Tiryaki Sen et al., 2013) Years of work in the profession (Ozduyan Kilic, 2018; Tiryaki Sen et al., 2013; Uzuner, 2012) Years of work at the current institution (Ozduyan Kilic, 2018)	Years of work in an administrative position (Ozduyan Kilic, 2018; Tiryaki Sen et al., 2013) Years of work as SSN at the current institution (Ozduyan Kilic, 2018) Work stress (Zyl et al., 2017) Noninterventionist (laissez-faire) leadership (Tyczkowski et al., 2015)
	Related not to the institution and employees	Working time in the institution (Boivin, 2013; Sobas-Gonzalez, 2013) Organizational commitment (Boivin, 2013)	Hospital type (Kılıç, 2018) Job satisfaction of nurses working in the institution (Munro, 2011; Sobas-Gonzalez, 2013)	Patient care outcomes (Munro, 2011)

of the EI components of interpersonal relationships, dedication, and flexibility also increased (Gulluce & Iscan, 2010). According to the results given here, it may be stated that EI levels are higher among individuals with higher levels of education. This conclusion has also been supported by other studies (Goleman, 1995, 2005; Kahraman & Hicdurmaz, 2016).

Experience factor: Regarding the relationship between experience and EI, some studies that were reviewed in this systematic review reported increased scores of EI that were correlated with increased levels of experience in administrative positions. Some other studies found no relationship of the work experience of participants as nurse managers, their years of working at their current hospital, and their years of working in the position of nurse managers at their current institution to their EI scores. Some previous studies have reported similar results (Akbolat & Isık, 2015; Saeid et al., 2013; Saygın, 2015). It is an expected result that as one's experience in the profession and their years of working in administrative positions increase, their skills of interacting with people and their interpersonal relationships will also be strengthened, and accordingly, their EI levels will increase.

Training factor: In this systematic review, it was observed that the EI scores of nurse managers who have received training and obtained expertise certificates about topics such as management and conflict were higher than the scores of those without such qualifications, but participation in training,

courses, and seminars about topics such as leadership, stress management, teamwork, and motivation did not affect EI scores. Gardner (2013) argued that EI can be increased with training. Similarly, Orsal (2014) reported that nurse managers who had participated in activities such as conferences and seminars in the last year had higher EI levels. Asi Karakas and Kucukoglu (2011) stated that nurses who had received training on empathy, coping with stress, and communication had higher levels of EI, whereas Kahraman and Hicdurmaz (2016) found higher EI scores in nurses who had received training and read books about self-improvement. These results may suggest that training received in addition to vocational training may increase EI.

Satisfaction and ability factor: This systematic review revealed a strong correlation between the self-management component of EI in nurse managers and their job satisfaction and administrative skill levels. Likewise, in the literature, positive relationships have been found between the EI levels of nurses and their job satisfaction, administrative performance, and clinical performance levels (Ariga et al., 2020; Buyukbayram & Gurkan, 2014; Gharaee et al., 2019). These results are valuable in terms of demonstrating that managers with high EI levels will also have higher levels of job performance and satisfaction.

Subordinate factor: In this study, it was seen that nurse managers with high levels of EI are supported more by their employees, and the EI levels of nurse managers do not affect the organizational commitment, working hours, or job satisfaction levels of their employees, but the EI levels of nurse managers reduce the burnout levels of their employees. Goren (2016) also reported a positive relationship between EI and job satisfaction. Managers with high EI levels are expected to have better interpersonal relationships and empathy skills. It is expected that employees working with managers who have these characteristics will have higher job satisfaction levels, higher organizational commitment, longer years of work at the organization, and lower burnout levels.

Work stress factor: This systematic review showed that nurse managers with high EI scores experience fewer work-related problems, but there is no significant relationship between work-related stress and EI. In contrast with these findings, studies in the literature have reported that the EI scores of nurses who think they have a successful career are higher, and there is a relationship between the work-related stress levels of emergency service nurses and their EI levels (Kahraman & Hicdurmaz, 2016; Nespereira-Campuzano & Vázquez-Campo, 2017).

Patient satisfaction: A study that was included in this systematic review reported that nurse managers working in units where patient satisfaction levels were high had high scores of EI, while another study in this review found that the EI scores of nurse managers did not affect patient care outcomes. Other studies have shown significant positive relationships between the satisfaction scores of patients and the empathetic concern, emotional awareness, and use of emotion levels of nurses and between the care outcomes of inpatients and the EI scores of nurses who provide care for these patients (Adams & Iseler, 2014; Oyur Celik, 2017).

Study Limitations

The strengths of this study may be listed as follows: the inclusion of comprehensive sources of search and the fact that most of the reviewed studies were recent studies and their quality assessment scores were high and moderate. Limitations were that the studies examined EI via different measurement tools and the tools had no cutoff scores, which created a difficulty in acquiring tangible data. Moreover, the small sample sizes of some studies and the high heterogeneity among the studies may be considered as a limitation that could weaken the results that were obtained. For this reason, to be able to control the potentially negative effects of the heterogeneity among the studies, the random effect model was selected in the meta-analysis.

Conclusion and Recommendations

Nurse managers have a highly significant role in the provision of health-care services. Therefore, the communication of nurses who are in administrative positions with their team and patients is very important. Administrators with high EI levels can take part in teamwork and collaboration more easily, empathize, and influence people. As a result of this study, it was revealed that the EI levels of nurses managers are associated with several factors. In the context of administration, it was found in the study that emotional intelligence has a significant role in administrative skills such as having the capacity to lead the team, managing conflicts and stress that could arise, increasing stakeholder satisfaction and performance, and positive administrative outputs. To get ahead in the sector they operate in and become pioneers in the health-care industry, institutions should work with nurse managers who have high levels of EI and know about factors that are associated with EI.

In the present study, it was determined that the mean combined EI score of the nurse executives was 105.734 ± 8.826; factors such as leadership behavior, educational level, age, and employee support were variables that increased the EI level; factors such as executives' styles of solving a conflict and higher levels of burnout of subordinates were variables that decreased the EI level; and factors such as marital status, in-service training, seniority, and hospital type were not related with the EI level. Since EI levels of the nurse executives varied according to variables such as age, gender, educational background, marital status, experience, management position, and participation in courses and seminars, it can be recommended that these variables be taken into consideration when selecting executives. In addition, since the executives' leadership behaviors and styles of solving a conflict had a positive correlation with their EI, it may be useful to take this condition into consideration in assignments and evaluations. Based on the analyses performed, it was thought that arranging training programs on EI would be useful for developing EI. It is possible to seek an answer to the question, "Do people with a higher level of emotional intelligence become executives or is it management that increases emotional intelligence?" by conducting studies that examine the EI levels of nurse executives and relevant factors.

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