




# The relationships between self-regulated learning in clinical nursing practice and self-efficacy: A cross-sectional study among nursing students

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## Abstract

**Purpose:** The aim is to examine self-regulated learning and self-efficacy levels of nursing students, the relationship between them, and to reveal the variables that make a significant difference.

**Design and Methods:** This descriptive, cross-sectional study was conducted with a total of 417 nursing students. The data were collected using the Self-Regulated Learning Scale in Clinical Nursing Practice and Self-Efficacy Scale.

**Findings:** Nursing students have high self-regulated learning ( $60.28 \pm 11.47$ ) and moderate self-efficacy ( $62.72 \pm 11.04$ ) scores, and there is a weak positive and significant relationship between them ( $r = 0.349$ ,  $p < 0.001$ ). Students' gender, grade, and self-confidence in practice made a significant difference in the scores ( $p < 0.05$ ).

**Practical Implications:** Developing the self-regulated learning levels of nursing students can help increase the clinical practice performance of students by affecting their self-efficacy levels.

## KEYWORDS

nursing students, self-efficacy, self-regulated learning

## 1 | INTRODUCTION

Self-regulated learning (SRL) is a mental information process in which the individuals gain control over their learning process that supports the control of their behavior, and provides an understanding of the cognitive, emotional, and motivational aspects of learning (Panadero, 2017). In the learning environment, students with SRL skills make an effort to gain knowledge and skills, manage the process and take initiative. Therefore, in recent years, it has been emphasized that it is an important factor to raise individuals who are aware of their learning and abilities, structure their knowledge with responsibility for education, and actively participate in the learning process (Babenko-Mould et al., 2016; Chen et al., 2019).

Another factor affecting the learning process is self-efficacy (SE); It is one of the cognitive perception factors that express the

individual's ability to distinguish between right and wrong behaviors and the ability of problem-solving when faced with a problem (Amanak et al., 2019). SE plays a very important role in the individual's adopting and initiating the behavior and maintaining the behavior change. SE is a key component in the nursing profession and is stated to be important in effective learning, professional development, and autonomy (Abdal et al., 2015; Munoz, 2021). Studies report that nursing students with high SE levels are more effective in intravenous catheter care and the prevention of phlebitis (Dogu Kokcu & Cevik, 2020) and that they care more about nurse-patient interaction (Eren & Sonay Turkmen, 2020).

Since nursing is a profession that requires cognitive, affective, and psychomotor learning, it is important to use innovative practices in nursing education. Since it is difficult for nurses who

\*All authors meet authorship criteria and endorsed the final article, and all authors with authorship rights were listed as authors.

cannot direct their learning to adapt to changes in the field of health, nursing educators should support students in developing their mental skills and analytical abilities to process information successfully, in addition to providing them with knowledge and practical skills (Moghadari Koosha et al., 2020). Instead of traditional methods, nurse educators should tend to train students with high SRL and SE levels, which have a significant impact on the development of metacognitive skills (Yao et al., 2021). It is thought that as the SRL and SE levels increase in nursing, a high level of thinking efficiency will be achieved, the level of success will be increased in clinical settings, it will also contribute to problem-solving skills and the quality of care will increase (Cho et al., 2017; Hwang & Oh, 2021; Ozvurmaz & Mandiracioglu, 2018).

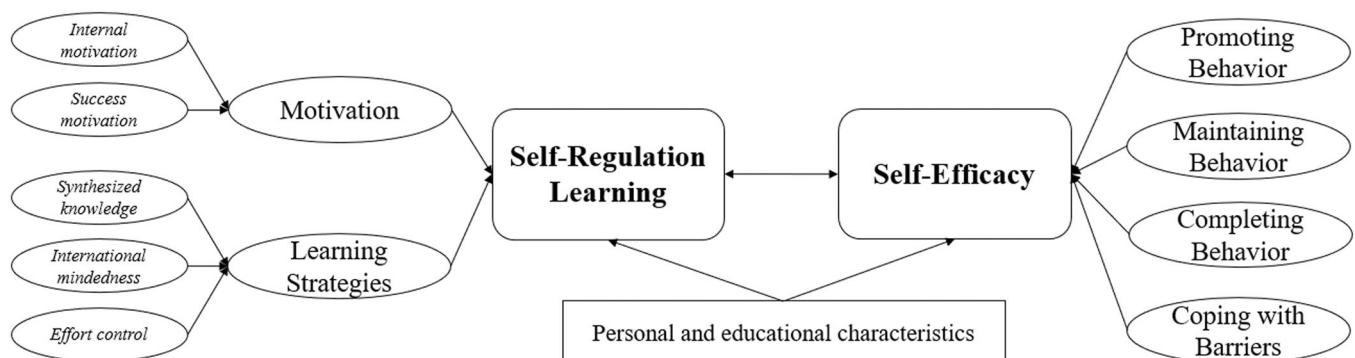
Health services are rapidly growing and changing. To meet the demands in the process of adapting to the changes experienced, nursing students must have a high level of SRL and SE levels (Digin & Iscan Atasen, 2021). However, there are limited studies in the literature examining SRL and SE levels together in nursing students (Chen et al., 2019; Hwang & Oh, 2021; Moghadari Koosha et al., 2020). Based on this gap in the literature, this study aimed to (1) determine the SRL and SE levels of nursing students, (2) reveal the relationship between them, and (3) determine the variables that make a significant difference in the measurements. In line with these aims, answers to the following research questions were sought.

Q1: What are the SRL and SE levels of nursing students?

Q2: Is there a significant relationship between the SRL and SE levels of nursing students?

Q3: What are the characteristics that make a significant difference in the SRL and SE levels of nursing students?

The conceptual framework created in line with the research objectives and questions is given in Figure 1.



**FIGURE 1** The conceptual framework of the study

## 2 | METHODS

### 2.1 | Design

It is a descriptive, correlational, and cross-sectional study.

### 2.2 | Sample and participants

The universe of the research consisted of a total of 471 students studying in the second, third, and fourth grades of a nursing school in Balikesir in the 2019–2020 academic year. The first-grade nursing students were not included in the study because they were not involved in clinical practice. The power analysis was used to calculate the sample size of the study. The effect size was 0.25. The number of people to be interviewed was calculated to be a minimum of 352 at the 5% margin of error and study power of 95%. Considering the possible data losses, more students were reached, and the study was completed with 417 students. Systematic random sampling was used as the sampling method. The inclusion rate was calculated as 88.7% for the study.

Most of the students were female (75.5%) and studying in the second-grade (37.6%). Their ages varied between 19 and 37 ( $M$ : 21.00;  $SD$ : 1.74), and general academic success ranged from 2.01 to 3.00 (58.0%). Most of the students did not consider the laboratory/technical room training they received as sufficient (43.6%) and thought that the contribution of training to their practical skills was slightly effective (61.9%). On the other hand, students were confident in clinical practice (49.4%) and thought that the impact of clinical practice training on their practical skills was highly effective (51.3%) (Table 1).

### 2.3 | Data collection

Data were collected between October and December 2019. After the students were informed about this study, the data collection tools were applied by the researchers outside class hours without interfering with the courses included in the curriculum. The questionnaires were left in the classroom in closed envelopes, and the students who filled out the questionnaires put their questionnaires in

**TABLE 1** Participant's characteristics (N = 417)

		n	%
Gender	Female	315	75.5
	Male	102	24.5
Grade	2	157	37.6
	3	135	32.4
	4	125	30.0
Age (Min:19–Max:37; Mean: 21.00; SD: 1.74)	19 years	63	15.1
	20 years	114	27.3
	21 years	109	26.1
	≥22 years	131	31.4
General academic success	<2.00	34	8.2
	2.01–3.00	242	58.0
	3.01–4.00	141	33.8
Opinion about the sufficiency of laboratory/technical room education	Yes	81	19.4
	No	182	43.6
	Partially	154	36.9
Opinion about the effect of laboratory/technical room on practical skills	Not effective	101	24.2
	Slightly effective	258	61.9
	Highly effective	58	13.9
Self-confidence levels in the clinical practice	Yes	206	49.4
	No	41	9.8
	Partially	170	40.8
Opinion about the effect of clinical practice education on practical skills	Not effective	35	8.4
	Slightly effective	168	40.3
	Highly effective	214	51.3

Abbreviations: %, percentage; n, number; SD, standard deviation.

sealed envelopes and dropped them in closed boxes placed in the classroom. The researcher checked these boxes every day and collected the envelopes. The implementation phase lasted approximately 10–15 min, and the researchers were present when the students were completing the introduction form and the two scales.

## 2.4 | Data collection tools

Data were collected via an Introductory Information Form, Self-Regulated Learning Scale in Clinical Nursing Practice, and Self-Efficacy Scale.

### 2.4.1 | Introductory information form

It consisted of 11 questions that included students' personal (age, gender, etc.) and educational characteristics (grade, the weighted overall average of success, etc.).

### 2.4.2 | Self-Regulated Learning Scale in Clinical Nursing Practice (SRLSCNP)

It was developed by Iyama and Maeda (2017) to evaluate the SRL levels of nursing students in clinical practice. The scale, adapted to Turkish by Senol (2018), consists of 16 items and two dimensions. The Motivation (SRL\_M) dimension of the scale consists of "Internal motivation (SRL\_M/IM; 4 items)" and "Success motivation (SRL\_M/SM; 3 items) sub-dimensions. Learning Strategies (SRL\_LS) dimension consists of "Synthesized knowledge (SRL\_LS/SK; 5 items), "International mindedness (SRL\_LS/IM; 2 items), and "Effort control (SRL\_LS/EC; 2 items) sub-dimensions (Iyama & Maeda, 2017; Senol, 2018). The SRLSCNP is rated using a 5 point Likert's scale. The score ranges from 16 to 80 points. As the score obtained from the scale increases, it means that the student's use of a self-regulated learning approach also increases.

The Cronbach's alpha value was reported as 0.85 for the total scale, 0.79 for the SRL\_M, and 0.81 for SRL\_LS (Iyama & Maeda, 2017). In this study, Cronbach's alpha values were  $\alpha = 0.94$  for SRLSCNP;  $\alpha = 0.87$  for SRL\_M, and  $\alpha = 0.94$  for SRL\_LS (Table 2).

### 2.4.3 | Self-Efficacy Scale (SES)

It was developed by Sherer et al. (1982) and its Turkish validity and reliability were determined by Gozum and Aksayan (1999). SES consists of 23 items and four sub-dimensions. The sub-dimensions of the scale are "Promoting behavior (SES\_PB; 8 items)," "Maintaining behavior (SES\_MB; 7 items)," "Completing behavior (SES\_CB; 5 items)," and "Coping with barriers (SES\_CwB; 3 items)," respectively. SES is a 5 point Likert's scale where scores range from 23 to 115 points. High scores indicate a high level of perception of self-efficacy.

It is reported that the internal consistency coefficient of the Turkish version of the scale is  $\alpha = 0.81$  and it varies between 0.64 and 0.82 in the sub-dimensions (Gozum & Aksayan, 1999). The internal consistency coefficients obtained in this study were  $\alpha = 0.87$  in the total scale and ranged between 0.70 and 0.82 in the sub-dimensions (Table 2).

## 2.5 | Data analysis

The data were analyzed with IBM SPSS Statistics 21 (licensed to Istanbul University Cerrahpasa) using a confidence level of 95%, with a significance level set at  $p < 0.05$ . Descriptive statistics (number, percentage, minimum–maximum, mean, and standard deviation) were used to determine student scores obtained from the scales based on their personal and educational characteristics. The Shapiro–Wilk test was used to verify the normal distribution of the data. Cronbach's alpha coefficient was used to determine internal consistency. Correlational analyses (Scatter plots and Pearson's Product–Moment correlation) were used to test the relationships between the measurements. Finally, nonparametric (Kruskal–Wallis and Mann–Whitney *U* test) and post hoc comparisons (Bonferroni corrected Mann–Whitney *U*) were performed to compare SRLSCNP and SES scores according to participants' characteristics.

TABLE 2 The relationship between SRLSCNP and SES scores of nursing students (N: 417)

	Range	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13
1 SRLSCNP	16–80	60.28 (11.47)	$\alpha: 0.94$												
2 • SRL_M	7–35	25.46 (5.57)	$0.917^{***}$ $\alpha: 0.87$												
3 SRL_M/IM	5–25	14.40 (3.50)	$0.842^{***}$ $0.916^{***}$ $\alpha: 0.86$												
4 SRL_M/SM	2–15	11.05 (2.74)	$0.785^{***}$ $0.860^{***}$ $0.582^{***}$ $\alpha: 0.81$												
5 • SRL_LS	9–45	34.82 (6.74)	$0.944^{***}$ $0.733^{***}$ $0.676^{***}$ $0.625^{***}$ $\alpha: 0.94$												
6 SRL_LS/SK	5–25	19.24 (3.89)	$0.911^{***}$ $0.704^{***}$ $0.656^{***}$ $0.592^{***}$ $0.968^{***}$ $\alpha: 0.90$												
7 SRL_LS/IM	2–10	7.81 (1.63)	$0.863^{***}$ $0.673^{***}$ $0.617^{***}$ $0.578^{***}$ $0.912^{***}$ $0.826^{***}$ $\alpha: 0.73$												
8 SRL_LS/EC	2–10	7.78 (1.70)	$0.831^{***}$ $0.651^{***}$ $0.588^{***}$ $0.569^{***}$ $0.875^{***}$ $0.758^{***}$ $0.769^{***}$ $\alpha: 0.85$												
9 SES	23–115	62.72 (11.04)	$0.349^{***}$ $0.295^{***}$ $0.308^{***}$ $0.174^{***}$ $0.350^{***}$ $0.308^{***}$ $0.354^{***}$ $0.344^{***}$ $\alpha: 0.87$												
10 • SES_PB	8–40	18.90 (6.15)	$0.156^{**}$ $0.126^*$ $0.141^{**}$ $0.054$ $0.161^{**}$ $0.117^*$ $0.186^{***}$ $0.193^{***}$ $0.838^{***}$ $\alpha: 0.82$												
11 • SES_MB	7–35	16.84 (7.34)	$0.188^{**}$ $0.146^{**}$ $0.181^{***}$ $0.030$ $0.200^{**}$ $0.166^{**}$ $0.204^{**}$ $0.217^{***}$ $0.843^{***}$ $0.774^{**}$ $\alpha: 0.77$												
12 • SES_CB	5–25	18.43 (3.52)	$0.519^{***}$ $0.446^*$ $0.428^{***}$ $0.339^{***}$ $0.515^{***}$ $0.494^{***}$ $0.489^{***}$ $0.444^{***}$ $0.165^{**}$ $0.270^{***}$ $0.227^{***}$ $\alpha: 0.72$												
13 • SES_CwB	3–15	9.22 (2.28)	$0.338^{***}$ $0.323^{***}$ $0.303^{***}$ $0.259^{***}$ $0.309^{***}$ $0.299^{***}$ $0.293^{***}$ $0.259^{***}$ $0.382^{***}$ $0.007$ $0.039$ $0.506^{***}$ $\alpha: 0.70$												

Abbreviations:  $\alpha$ , Cronbach's alpha internal consistency coefficient; M, mean; SD, standard deviation; Range, possible scale score range; SES, Self-Efficacy Scale, SES\_PB: Promoting behavior, SES\_MB: Maintaining behavior, SES\_CB: Completing behavior, SES\_CwB: Coping with barriers; SRLSCNP, Self-Regulating Learning Scale in Clinical Nursing Practice; SRL\_M, Motivation; SRL\_M/IM, Internal motivation; SRL\_M/SM, Success motivation; SRL\_LS, Learning Strategies; SRL\_LS/SK, Synthesized knowledge; SRL\_LS/IM, International mindedness; SRL\_LS/EC: Effort control.

\* $p < 0.05$ ;

\*\* $p < 0.01$ ;

\*\*\* $p < 0.001$ .

**TABLE 3** Comparison of SRLSCNP scores according to the participant's characteristics (N:417)

	n	SRLSCNP M (SD)	SRL-M M (SD)	SRL_M/IM M (SD)	SRL_M/SM M (SD)	SRL_LS M (SD)	SRL_LS/SK M (SD)	SRL_LS/IM M (SD)	SRL_LS/EC M (SD)	
Gender	Female	315	60.86 (11.51)	25.61 (5.58)	14.41 (3.50)	11.20 (2.69)	35.24 (6.75)	19.45 (3.88)	7.86 (1.61)	7.88 (1.66)
	Male	102	58.50 (11.17)	24.96 (5.51)	14.36 (3.50)	10.59 (2.86)	33.53 (6.55)	18.54 (3.85)	7.53 (1.65)	7.45 (1.78)
Test and significance			U = 18.439.500 <b>p = 0.025*</b>	U = 17.286.000 <b>p = 0.247</b>	U = 18.096.000 <b>p = 0.053</b>	U = 16.550.500 <b>p = 0.644</b>	U = 18.640.000 <b>p = 0.015*</b>	U = 18.278.500 <b>p = 0.034*</b>	U = 18.306.000 <b>p = 0.029*</b>	U = 18.378.000 <b>p = 0.022*</b>
Grade	Grade II <sup>a</sup>	157	62.19 (10.33)	26.09 (4.91)	14.73 (3.18)	11.35 (2.52)	36.10 (6.24)	20.02 (3.61)	8.08 (1.53)	7.99 (1.66)
	Grade III <sup>b</sup>	135	60.31 (11.30)	25.61 (5.53)	14.56 (3.49)	11.05 (2.78)	34.70 (6.48)	19.19 (3.75)	7.74 (1.54)	7.76 (1.62)
	Grade IV <sup>c</sup>	125	57.84 (12.57)	24.48 (6.24)	13.80 (3.83)	10.68 (2.94)	33.35 (7.32)	18.28 (4.18)	7.52 (1.77)	7.53 (1.79)
Test and significance			KW = 9.356 <b>p = 0.009**</b>	KW = 4.155 <b>p = 0.125</b>	KW = 4.082 <b>p = 0.130</b>	KW = 3.006 <b>p = 0.222</b>	KW = 11.605 <b>p = 0.003**</b>	KW = 15.395 <b>p &lt; 0.001**</b>	KW = 7.466 <b>p = 0.024**</b>	KW = 5.802 <b>p = 0.055</b>
Self-confidence in practice	Yes <sup>a</sup>	206	61.60 (12.62)	26.15 (6.16)	14.90 (3.95)	11.24 (2.93)	35.45 (7.25)	19.62 (4.18)	7.96 (1.72)	7.87 (1.85)
	No <sup>b</sup>	41	52.29 (12.06)	21.43 (5.97)	11.80 (3.44)	9.63 (3.28)	30.85 (7.38)	16.92 (4.31)	6.92 (1.66)	7.00 (1.96)
	Partially	170	60.60 (8.85)	25.58 (4.16)	14.41 (2.54)	11.17 (2.25)	35.01 (5.54)	19.32 (3.18)	7.83 (1.42)	7.85 (1.36)
Test and significance			KW = 28.431 <b>p &lt; 0.001***</b>	KW = 25.363 <b>p &lt; 0.001***</b>	KW = 31.921 <b>p &lt; 0.001***</b>	KW = 10.708 <b>p = 0.005**</b>	KW = 19.127 <b>p &lt; 0.001***</b>	KW = 19.227 <b>p &lt; 0.001***</b>	KW = 16.957 <b>p &lt; 0.001***</b>	KW = 9.868 <b>p = 0.007**</b>
			a > b	a > b	a,c > b	a,c > b	a > c,b	a,c > b	a,c > b	a,c > b

Note: Only the characteristics that make a significant difference are shown in the table.

Abbreviations: KW: Kruskal–Wallis; M, mean; n, number; SD, standard deviation; **SRLSCNP, Self-Regulating Learning Scale in Clinical Nursing Practice**; SRL\_M, Motivation; SRL\_M/IM, Internal motivation; SRL\_M/SM, Success motivation; SRL\_LS/SK, Synthesized knowledge; SRL\_LS/IM, International mindedness; SRL\_LS/EC, Effort control; U, Mann–Whitney U.

\* $p < 0.05$ ;

\*\* $p < 0.01$ ;

\*\*\* $p < 0.001$ .

**TABLE 4** Comparison of SES scores according to the participant's characteristics (N:417)

		n	SES M (SD)	SES_PB M (SD)	SES_MB M (SD)	SES_CB M (SD)	SES_CwB M (SD)
Gender	Female	315	62.00 (10.40)	17.65 (5.91)	16.45 (4.99)	18.66 (3.30)	9.21 (2.23)
	Male	102	64.94 (12.60)	19.87 (6.59)	18.07 (5.82)	17.71 (4.04)	9.27 (2.40)
Test and significance			U = 13.778.000 <i>p</i> = 0.034*	U = 13.125.500 <i>p</i> = 0.005**	U = 13.368.000 <i>p</i> = 0.011*	U = 17.971.000 <i>p</i> = 0.070	U = 15.764.500 <i>p</i> = 0.811
Grade	Grade II <sup>a</sup>	157	61.03 (10.78)	17.00 (6.18)	15.82 (5.19)	18.82 (3.21)	9.36 (2.26)
	Grade III <sup>b</sup>	135	62.05 (8.41)	17.99 (5.10)	16.31 (4.40)	18.68 (3.60)	9.05 (2.27)
	Grade IV <sup>c</sup>	125	65.55 (13.19)	19.92 (6.77)	18.70 (5.69)	17.66 (3.69)	9.25 (2.29)
Test and significance			KW = 12.762 <i>p</i> = 0.002** c > b > a	KW = 15.478 <i>p</i> < 0.001*** c > a,b	KW = 22.469 <i>p</i> < 0.001*** c > b > a	KW = 6.228 <i>p</i> = 0.044* c > a,b	KW = 1.588 <i>p</i> = 0.452
Self-confidence in practice	Yes <sup>a</sup>	206	62.49 (11.85)	20.32 (6.46)	18.53 (5.61)	19.21 (3.48)	9.41 (2.43)
	No <sup>b</sup>	41	60.90 (10.66)	16.75 (5.11)	15.63 (4.59)	16.36 (3.94)	9.14 (2.57)
	Partially	170	62.46 (10.06)	18.64 (5.79)	16.80 (4.86)	17.97 (3.17)	9.02 (1.97)
Test and significance			KW = 2.959 <i>p</i> = 0.228	KW = 16.112 <i>p</i> < 0.001*** a > c > b	KW = 7.882 <i>p</i> = 0.019* a > c > b	KW = 28.362 <i>p</i> < 0.001*** a > c > b	KW = 2.075 <i>p</i> = 0.354

Note: Only the characteristics that make a significant difference are shown in the table.

Abbreviations: KW: Kruskal–Wallis; M, mean; n, number; SD, standard deviation; SES, Self-Efficacy Scale; SES\_PB, Promoting behavior; SES\_MB, Maintaining behavior; SES\_CB, Completing behavior; SES\_CwB, Coping with barriers; U, Mann–Whitney U.

\**p* < 0.05;

\*\**p* < 0.01;

\*\*\**p* < 0.001.

## 2.6 | Ethical considerations

Ethical approval was obtained from the ethics committee of a Bali-kesir University (Date and Number: 2019/14) to conduct the study. Institutional permission was obtained from the university where the research was conducted. Permission to use the scales was obtained from the scale authors via email. Written and verbal consent of the students and their volunteering were taken as a basis for participation in the research. Informed consent was obtained from the students who agreed to provide data for the study, and the data collection tool was distributed and collected in a sealed envelope.

## 3 | RESULTS

In this section, the findings of the research questions are given in order.

### 3.1 | SRLSCNP and SES scores of nursing students

The SRLSCNP score of the students was  $60.28 \pm 11.47$ , SRL\_M score was  $25.46 \pm 5.57$ , and SRL\_LS score was  $34.82 \pm 6.74$ . The total SES

score was  $62.72 \pm 11.04$  and ranged between  $9.22 \pm 2.28$  and  $18.90 \pm 6.15$  in subdimensions.

### 3.2 | The relationship between SRLSCNP and SES scores of nursing students

It was determined that there was a positive, weak, and statistically significant relationship between SRLSCNP and SES scores ( $r = 0.349$ ,  $p < 0.001$ ). The SES subscale with the strongest association with SRLSCNP was SES\_CB ( $r = 0.319$ ,  $p < 0.001$ ). The SRLSCNP subdimension, which had the strongest relationship with SES, was found to be SRL\_LS/IM ( $r = 0.354$ ,  $p < 0.001$ ) (Table 2).

### 3.3 | Comparison of SRLSCNP and SES scores according to students' characteristics

Table 3 shows the personal and educational variables that make a significant difference in the SRLSCNP and subdimension scores of the students. The results of the analysis showed that students' gender ( $p < 0.05$ ), grade ( $p < 0.01$ ), and self-confidence levels in clinical practice ( $p < 0.001$ ) made a significant difference on the scores they



obtained from the scale. Female students, second-grade students, and those who were confident in clinical practice had higher SRLSCNP scores (Table 3).

Table 4 shows the personal and educational variables that make a significant difference in SES and sub-dimension scores. According to the results, the gender of the students ( $p < 0.01$ ) and the grade ( $p < 0.01$ ) made a significant difference, where male students and those studying in higher grades had higher scores (Table 4).

## 4 | DISCUSSION

This study was carried out to determine the relationships between the SRL and SE levels of nursing students in clinical practice and the personal and educational characteristics that make a significant difference.

As a result of the research, it was determined that the SRL levels of the nursing students were high. Similar to the results of this study, it is reported in the literature that nursing students have high SRL levels (Digin & Iscan Atasene, 2021; Hwang & Oh, 2021), while some report that they have moderate SRL learning skills (Chen et al., 2019; Denat et al., 2017). This finding can be considered as a desirable situation since the high SRL level of the students, in general, indicates that the students are determined individuals who put more effort into it.

In the study, it was determined that the SE levels of nursing students were moderate. Similarly, in the literature, besides the studies reporting that the SES level is moderate (Hwang & Oh, 2021; Ornek & Kurklu, 2017), it is possible to come across studies that indicate a high SES level (Amanak et al., 2019). Considering the effect of SE on nursing students' self-confidence, courage to practice, and success, it is thought that attention should be paid to the moderate SE level and efforts are needed to improve it.

In the study, a significant relationship was found between the total scale scores and sub-dimension scores of the nursing students. Therefore, it is seen that as the SRL level of nursing students increases, their SE levels also increase. This finding is important as it shows that SRL levels can affect all educational performances of students, from clinical practice to academic achievement. Similarly, studies have shown that there are significant relationships between SRL and SE levels (Chen et al., 2019; Moghadari Koosha et al., 2020). In his study, Alotaibi (2016) stated that as a result of the high SRL levels of nursing students, their academic performance is also high.

It has been seen that the SES sub-dimension, which has the strongest relationship with SRL, is the completing behavior sub-dimension. Therefore, it can be said that as the SRL level of nursing students increases, they are more willing and successful in completing the behavior and will be sufficient in performing the actions. On the other hand, it was found that the SRLSCNP sub-dimension, which has the strongest relationship with SES, is international mindedness (IM). It is stated that IM is about

developing an understanding of the complexity, diversity, and motives that underlie human actions and that individuals with IM are open-minded and respect each other's cultures and beliefs (Hacking et al., 2018; Metli & Lane, 2020). In this respect, as the SES level increases, the increase in IM levels will contribute to the individual development of nursing students and support the professional development of the nursing profession.

When the SRL and SES levels of nursing students were compared according to their personal characteristics, it was determined that gender made a significant difference in both measurements. However, interestingly, the SRL level of the female students and the SE level of the male students were higher. In the literature, studies are reporting different results on this issue (Albagawi et al., 2019; Ornek & Kurklu, 2017; Tas & Akin, 2018). In this case, it can be thought that gender-related features may be effective, as well as social gender roles. However, it is a fact that studies examining this finding in-depth are needed.

Another variable that made a difference on the scale scores was the grade of the students. Interestingly, as the grade of students increases, SRL levels decrease, and SE levels increase. In the study of Amanak et al. (2019), it was determined that the SE mean scores of the students did not differ significantly according to the grades, while Chen et al. (2019) showed that as the grade increases, the SE level decreases. In a study conducted to determine the SRL levels of nursing students, it was stated that the score decreases as the grade increases, and in another study, the SRL level increases as the grade increases (Chen et al., 2019; Denat et al., 2017). Considering the contribution of SRL and advanced SE abilities to nursing students' learning and a greater sense of competence (Garrin, 2014), it is thought that it is necessary to focus on lower SRL levels in senior nursing students.

Finally, students who were confident in clinical practice were expected to have higher levels of both SRL and SE. As expected, SRL levels were higher, but there was no significant difference in the total SE score although there was a difference in SE sub-dimensions. Therefore, it can be said that the results contradict the results that high SE makes it easier for students to increase their self-confidence and overcome obstacles in patient care (Gulley et al., 2021). Again, it is stated in some studies that nursing students with high self-confidence will have high SE and performance, they will be able to approach events with a critical view, their problem-solving success will be high and they will be able to struggle with daily life problems (Razaghpoor et al., 2021; Tas & Akin, 2018; Walsh et al., 2021). However, the results obtained from the study partially overlap with the information in the literature.

### 4.1 | Limitations

The strength of this study is the large sample size. The data were collected by equally trained researchers for each structure, but this study was conducted with students from a single center. Thus, the results of this study cannot be generalized to all students.

## 5 | IMPLICATIONS FOR NURSING PRACTICE

Due to the increasingly complex and variable medical environments, there is a need to improve the quality of nursing students' learning abilities. As future professionals, it is essential to develop SRL and SE skills to provide quality and safe health care. The clinical SRL and SE levels of the students are closely related to each other. According to the results of the research, as the self-confidence level of nursing students increases, SRL levels increase. SRL levels should especially be monitored for senior nursing students to be effective in their clinical performance. Effective clinical training should create a sense of SE among nursing students, which is an important component for acting independently and competently in the nursing profession. Considering that the SE levels of the students are lower than desired despite high SRL levels, it is recommended to include the development of SE skills in nursing education programs and to develop and update the curriculum contents in this direction every year.

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### CONFLICT OF INTERESTS

The authors declare no conflict of interest.

### AUTHOR CONTRIBUTIONS

Substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; Ozlem Dogu, Ayse Karadas, and Feride Eskin Bacaksiz. Drafting the article or revising it critically for important intellectual content; Ozlem Dogu, Ayse Karadas, and Feride Eskin Bacaksiz. Final approval of the version to be published: Ozlem Dogu, Ayse Karadas, and Feride Eskin Bacaksiz.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in [repository name e.g. "figshare"] at [http://doi.org/\[doi\], reference number \[reference number\]](http://doi.org/[doi], reference number [reference number]). The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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