



# 간호대학생의 진로결정유형과 유형별 특성

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## Career decision profiles and characteristics of nursing students

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**Purpose:** This study aimed to identify the career decision profiles for nursing students and analyze their career barriers, preparation behaviors, decision-making self efficacy, and adaptability according to the career decision profiles. **Methods:** This cross-sectional study used content analysis. A total of 219 nursing students enrolled in two private Korean universities participated in this study. The data were collected in person and via email between December 8 and 31, 2020. **Results:** The decidedness and comfort results were statistically significant. Four clusters were identified: undecided-uncomfortable, decided-uncomfortable, decided-comfortable, and undecided-comfortable. Most participants were found to be decided-uncomfortable, followed by decided-comfortable, undecided-uncomfortable, and undecided-comfortable. The self efficacy scores were higher for the decision-comfortable profile than for the undecided-uncomfortable and decided-uncomfortable profiles. The mean adaptability scores were higher for the decision-comfortable profile than for the undecided-comfortable profile. Career barriers were negatively correlated with preparation behavior, decision-making self efficacy, and adaptability, while preparative behaviors were positively correlated with decision-making self efficacy and adaptability. Decision-making self efficacy was positively correlated with adaptability. The mean career barriers, preparation behaviors, decision-making self efficacy, and adaptability scores differed significantly across profiles. The mean career barrier score was higher for the undecided-uncomfortable than for the decided-comfortable profile; preparation behaviors exhibited no significant differences. **Conclusion:** Tailored career coaching and counseling programs based on personal characteristics and areas of interest are needed for freshmen and senior nursing students to reduce career barriers and to improve preparation behaviors, decision-making self efficacy, and adaptability.

**Keywords:** Decision making, Self efficacy, Nursing students, Career choice

## Introduction

Before embarking on their journey in the professional world, college graduates must be equipped to make their career decisions based on an understanding of themselves and an

adequate understanding and exploration of the professional world [1]. Nursing students are generally considered to have already decided on their career path upon entering college, unlike students in other majors. However, some students choose nursing solely based on excellent job prospects; consequently, they face

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difficulties adapting to their major and making career decisions. Students choosing nursing based on employment prospects or parental influence rather than their aptitude and preference tend to express higher dissatisfaction with their major [2].

The economic downturn caused by the coronavirus disease 2019 (COVID-19) pandemic had substantial repercussions on the job market, with the number of jobs lost reported to be more than four-fold that in the 2009 financial crisis [3]. Consequently, anxiety about the COVID-19 pandemic and employment adversely impacted overall college life [4], and increased perceptions of career barriers hinder students' career preparation behaviors [5]. As the COVID-19 pandemic continues, some hospitals delayed recruitment or reduced the number of staff as hospital operations were challenging due to the occurrence of people infected with COVID-19 or the atmosphere limiting social visits to hospitals [6]. Thus, nursing students faced difficulties preparing for their careers due to social changes related to the COVID-19 pandemic, such as classes that were not taught face-to-face, social distancing, fear of infection, lack of social interactions, and number of COVID-19 cases [7].

Career barriers (hereafter, barriers) refer to intrapersonal factors or environmental events/conditions that impede an individual's career development [8]. They include internal psychological and external environmental barriers [9]. Park and Kang [5] reported that career preparation behaviors declined with increased perceptions of barriers. Lee and Jung [10] found a relationship between low level of career preparation and perceived barriers among students.

Career preparation behaviors (hereafter, preparation) include collecting potential job information and job hunting [11]. Preparation encompasses an individual's efforts to achieve reasonable and specific career goals and actions since deciding on a career path [12]. Park and Kang [5] reported a positive correlation between career decision making self efficacy and preparation.

Career decision making self efficacy (hereafter, self efficacy) was introduced by Taylor and Betz [13] and is defined as an individual's confidence in successfully making a career decision. Savickas and Porfeli [14] stated that self efficacy is influenced by career adaptability (hereafter, "adaptability"), which comprises proficiency in transitioning and preparing to handle occupational and unpredictable situations, changes, and tasks in future work conditions and work environments, including changing job types and work arrangements [15].

Jung [16] conducted a cluster analysis of the relationship between career identity, major satisfaction, and career stress among nursing students according to their type of career before COVID-19 pandemic. The result showed that the decision-comfort type had high satisfaction with their major and career identity, whereas the undecided-discomfort type had high satisfaction with their major and career identity. Career stress was also high. Based on this research, the current study examined the characteristics of nursing students by career decision type at the start of the COVID-19 pandemic using cluster analysis and then investigated changes in nursing students' career decision type.

We selected the study variables (barriers, preparation, self efficacy, and adaptability) based on previous studies [5,10]. Recent studies conducted to aid in evaluating and developing interventions tailored to college students' various career decision profiles (CDPs) [15,17] examined students with decided and undecided career paths; they indicate that failing to consider differences in career development characteristics between these two groups may undermine career counseling and intervention effectiveness.

Jones and Chenery [18] identified the characteristics of various CDPs under the assumption that even those who have decided on their career paths may feel uncomfortable and observed that approximately 28.0% of college students fall under the "decided-uncomfortable" profile (i.e., making a career decision but feeling uncomfortable with the decision) [16]. Jung [16] reported that students with the "decided-comfortable" profile had high major satisfaction and career identity; those with the "undecided-uncomfortable" profile had high career stress. Meanwhile, Korean researchers reported that 40.0%~53.0% of the 70.0%~73.0% of decided participants were uncomfortable with their decisions [15,17].

We aimed to analyze the CDPs of nursing students post-COVID-19 using Jung's [16] findings and examine differences between the profiles regarding barriers, preparation, self-efficacy, and adaptability. We also sought to identify the nursing students' general characteristics based on their CDPs and correlations between barriers, preparation, self-efficacy, and adaptability. This study aimed to provide evidence to aid the development of tailored career education and counseling programs for nursing students that enhance their career decidedness and comfort amid turbulent times (i.e., COVID-19 pandemic).

## Methods

### Participants and data collection

This study conducted a descriptive survey of volunteer participants. The target population for this study was students in Korea enrolled in nursing major, while the accessible population was nursing students enrolled in nursing education institutions in “Daegu” or “Jeonju” city. The two universities studied were private schools and had a similar number of student and were similar types of institutions. The inclusion criteria for participants were the ability to communicate, be alert, understand the purpose and content of the study, and voluntarily agree to participate.

The sample size was determined using the G\*Power 3.1.9.2 software. For a significance level of .05, power ( $1-\beta$ ) of .80, medium effect size (.25), and four groups, the required sample size for a one-way ANOVA was 180, and we recruited 219 participants considering a dropout rate of 15% [19]. All 219 questionnaires were returned (100% response rate). We followed the STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) guidelines when conducting this study.

Data were collected in person and via email by a trained researcher after obtaining the email addresses of participants who consented to participate in the study from December 8 to 31, 2020. Questionnaire completion took approximately 15–20 minutes, after which each participant received a gift card. The participants received the questionnaires and were asked to complete them at their convenience and return them to the research assistant. Questionnaires were distributed to 230 participants. We retrieved 226 questionnaires and excluded seven as unsuitable/inappropriate for the study; thus, 219 questionnaires were included in the final analysis.

### Instruments

The tool developed by Jones and Chenery [18] and modified by Gao [15] was used to identify CDPs. The original scale comprised decidedness (2 items), comfort (2 items), and reason for undecidedness (12 items); however, Jones and Chenery [18] noted that a significant number of undecided students reported feeling comfortable with their undecided status and separated comfort into another dimension from decision. Therefore, We only used four items (decidedness and comfort). Responses were rated on a

four-point Likert scale (1=strongly disagree, 4=strongly agree), with higher scores indicating greater decidedness and comfort. Cronbach’s  $\alpha$  was .85 for the original scale [16] and Cronbach’s  $\alpha$  values for decidedness and comfort were .79 and .81, respectively, for the scale modified by Gao [15] and .75 and .89, respectively, for the present study.

Barriers were assessed using the Korean Career Barrier Inventory developed by Kim and Ra [17] and modified by Shim [20]. This 25-item inventory uses a four-point Likert scale, with higher scores indicating greater barriers. Cronbach’s  $\alpha$  was .85 for the original scale [9] and .92 for this study.

Preparedness among college students was measured using Kim’s [12] 18-item scale rated on a four-point Likert scale; higher scores indicated higher preparedness. Cronbach’s  $\alpha$  was .86 for the original scale [12] and .89 for this study.

Self efficacy was assessed using Betz and Hackett’s [21] Career Decision Making Self Efficacy Scale-Short Form which was validated by Lee [22]. This 25-item tool uses a six-point Likert scale, with higher scores indicating greater self efficacy. Cronbach’s  $\alpha$  was .85 for the original scale [22] and .93 for this study.

We assessed adaptability using the Career Adapt-Ability Scale developed by Savickas and Porfeli [14], and modified by Jeong and Jyung [23] to align with the original scale. This 25-item inventory uses a five-point Likert scale; higher scores indicate higher adaptability. Cronbach’s  $\alpha$  was .85 in a previous study [23] and .95 in this study.

### Ethical considerations

This study was approved by the institutional review board designated by the Ministry of Health and Welfare (IRB No. P01-202012-21-008). The procedures were carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). All participants provided written informed consent prior to participation. Participants were informed that they could withdraw from the study at any time.

### Data analysis

Data were analyzed using the IBM SPSS 26.0 software (IBM Corp.). Participants’ general characteristics and outcome measures were analyzed using descriptive statistics. To identify CDPs, we performed a partitioning clustering analysis (K-means clustering).

Cluster analysis is a statistical technique for clustering individuals in a population based on the similarity of various attributes. It allows for the analysis of common characteristics within groups while identifying dissimilar characteristics between different groups [24]. K-means clustering is a non-hierarchical method. Unlike hierarchical clustering analysis, it allows researchers to specify the number of clusters to be analyzed, enabling them to select k clusters that best capture the characteristics of the groups by comparing the results. In the present study, we performed K-means clustering using a specific procedure.

First, to examine the similarities and differences in the four CDPs proposed by Jones and Chenery [18], we analyzed the centroids and distance between clusters. Furthermore, we performed a one-way ANOVA to determine the degree of contribution of the four items for decidedness and comfort on cluster differentiation. Second, after analyzing the CDPs of nursing students using clustering, the mean differences across the profiles were analyzed using a one-way ANOVA and Scheffé's post-hoc test. In addition, we finalized the clusters into four profiles based on the two major components (decidedness and

comfort). Third, we analyzed the differences in the participants' general characteristics and outcome measures according to the four CDPs identified through clustering analysis using chi-square test, Fisher's exact test, one-way ANOVA, and post-hoc test. Finally, the relationships between barriers, preparation, self efficacy, and adaptability were analyzed using Pearson's correlation coefficients.

## Results

### Participant characteristics

The participants' sociodemographic characteristics are presented in Table 1. The majority of the participants were female and in their junior or senior of university. Most participants were atheist or Buddhist, followed by Christian. Moreover, many participants stated that they do not engage in extracurricular activities. The most common motive for choosing nursing was a high employment rate.

Table 1. Differences in General Characteristics by Career Decision Type (N=219)

Variables	Categories	Undecided- uncomfortable (n=37)	Decided- uncomfortable (n=94)	Decided- comfortable (n=80)	Undecided- comfortable (n=8)	Total	χ <sup>2</sup> (p)
		n (%)					
Sex	Male	4 (10.8)	16 (17.0)	9 (11.3)	3 (37.5)	32 (14.6)	4.60* (.169)
	Female	33 (89.2)	78 (83.0)	71 (88.8)	5 (62.5)	187 (85.4)	
Grade	Freshman	9 (24.3)	27 (28.7)	13 (16.3)	1 (12.5)	50 (22.8)	19.46 (.022)
	Sophomore	2 (5.4)	24 (25.5)	18 (22.5)	4 (50.0)	48 (21.9)	
	Junior	13 (35.1)	20 (21.3)	15 (18.8)	1 (12.5)	49 (22.4)	
	Senior	13 (35.1)	23 (24.5)	34 (42.5)	2 (25.0)	72 (32.9)	
Religion	Christian	9 (24.3)	27 (28.7)	13 (16.3)	1 (12.5)	50 (22.8)	11.24* (.433)
	Catholic	2 (5.4)	24 (25.5)	18 (22.5)	4 (50.0)	48 (21.9)	
	Buddhism	13 (35.1)	20 (21.3)	15 (18.8)	1 (12.5)	49 (22.4)	
	None	13 (35.1)	23 (24.5)	34 (42.5)	2 (25.0)	72 (32.9)	
Extracurricular activities	Yes	12 (32.4)	58 (61.7)	57 (71.3)	4 (50.0)	131 (59.8)	16.35 (.001)
	No	25 (67.6)	36 (38.3)	23 (28.8)	4 (50.0)	88 (40.2)	
Nursing major selection motive	High school grades	0 (0.0)	4 (4.3)	8 (10.0)	1 (12.5)	13 (5.9)	24.89* (.051)
	Aptitude and preference	7 (18.9)	31 (33.0)	35 (43.7)	1 (12.5)	74 (33.8)	
	Employment rate	24 (64.9)	43 (45.7)	26 (32.5)	5 (62.5)	98 (44.8)	
	Parents or surrounding person's recommendation	2 (5.4)	9 (9.5)	4 (5.0)	0 (0.0)	15 (6.8)	
	Opportunity to go abroad	2 (5.4)	3 (3.2)	1 (1.3)	1 (12.5)	7 (3.2)	
	Other	2 (5.4)	4 (4.3)	6 (7.5)	0 (0.0)	12 (5.5)	

\* Fisher's exact test

### CDPs identification

- Centroid

K-means clustering was performed based on decidedness and comfort. Cluster 1 had the lowest comfort, whereas Cluster 2 had relatively high decidedness. Cluster 3 had the highest comfort level, whereas Cluster 4 had higher comfort than decidedness. Thus, Clusters 1, 2, 3, and 4 were designated as the profiles undecided-uncomfortable, decided-uncomfortable, decided-comfortable, and undecided-comfortable, respectively.

- Distance between clusters

The distance between Clusters 1 and 3 was the longest. In other words, the undecided-uncomfortable and decided-comfortable profile groups showed the largest gap. The distance between Cluster 2 and 4 was the longest. In Cluster 4, the distance to Cluster 3 was the longest.

- Clustering means in ANOVA

The degree of contribution of four variables that define a

cluster-on-cluster differentiation was analyzed using a one-way ANOVA (Table 2). Decidedness and comfort significantly differed, indicating that they were significant factors in clustering.

### Differences among clusters according to decision and comfort

The mean differences among the profiles were analyzed with a one-way ANOVA and post-hoc test (Table 3) and CDPs were clustered by decidedness and comfort. Decidedness and comfort were statistically significant. Cluster 2 had the highest mean decision score, followed by Clusters 3, 1, and 4. Cluster 3 had the highest mean comfort score, followed by Clusters 4, 2, and 1.

### CDP and differences in general characteristics

The CDPs significantly differed by school year and extracurricular activities (Table 1). The decided-comfortable profile comprised predominantly senior students and, compared with other profiles, a higher percentage of sophomore students.

Table 2. ANOVAs according to Cluster

(N=219)

Career decision types		Cluster		Error		F ( <i>p</i> )
		Mean square	Degree of freedom	Mean square	Degree of freedom	
Decision	Item 1	6.62	3.00	.29	215.00	23.10 (<.001)
	Item 2	15.22	3.00	.31	215.00	48.89 (<.001)
Comfort	Item 3	42.92	3.00	.28	215.00	155.79 (<.001)
	Item 4	42.74	3.00	.30	215.00	144.30 (<.001)

Table 3. Differences in Decision and Comfort by Clusters

(N=219)

Items	Cluster	n (%)	Mean±SD	F ( <i>p</i> )	Scheffé test
Decision	Cluster 1	37 (16.9)	2.74±0.54	46.72 (<.001)	Cluster 3>2>1
	Cluster 2	94 (42.9)	3.55±0.42		
	Cluster 3	80 (36.5)	3.41±0.49		
	Cluster 4	8 (3.7)	2.06±0.42		
	Total	219 (100.0)	3.31±0.60		
Comfort	Cluster 1	37 (16.9)	1.41±0.45	215.13 (<.001)	Cluster 3>2>1
	Cluster 2	94 (42.9)	2.41±0.46		
	Cluster 3	80 (36.5)	3.56±0.43		
	Cluster 4	8 (3.7)	2.63±0.35		
	Total	219 (100.0)	2.67±0.89		

SD=standard deviation

The undecided-uncomfortable profile had an equally high percentage of junior and senior students. Those in the undecided-uncomfortable profile mostly did not engage in extracurricular activities, whereas those in the decided-comfortable profile mostly did. The undecided-comfortable profile showed an equal percentage of students with and without extracurricular activities.

**Correlations among barriers, preparation, self efficacy, and adaptability**

Barriers were negatively correlated with preparation, self-efficacy, and adaptability, whereas preparation was positively correlated with self-efficacy and adaptability. Self-efficacy was positively correlated with adaptability (Table 4).

**Differences in barriers, preparation, self efficacy, and adaptability according to CDP**

The mean differences in outcome measures were analyzed by CDP (Table 5). All outcome measures significantly differed by CDP. The post-hoc test revealed that the mean barrier score was

Table 4. Correlations between Career Barriers, Career Preparation Behavior, Career Decision Making Self Efficacy, and Career Adaptability (N=219)

Variables	Career barriers	Career preparation behavior		Career decision making self efficacy
		r	(p)	
Career preparation behavior	-0.25 (.001)			
Career decision making self efficacy	-0.66 (<.001)	.51	(<.001)	
Career adaptability	-0.63 (<.001)	.37	(<.001)	.70 (<.001)

Table 5. Differences in Career barriers, Career Preparation Behavior, Career Decision Making Self Efficacy, and Career Adaptability by Career Decision Type (N=219)

Variables	Career decision types	n	Mean ±SD	F (p)	Scheffé test
Career barriers	Undecided-uncomfortable <sup>a</sup>	37	2.77±0.49	19.64 (<.001)	a>c
	Decided-uncomfortable <sup>b</sup>	94	2.21±0.57		
	Decided-comfortable <sup>c</sup>	80	1.95±0.55		
	Undecided-comfortable <sup>d</sup>	8	2.49±0.50		
	Total	219	2.22±0.62		
Career preparation behavior	Undecided-uncomfortable <sup>a</sup>	37	2.10±0.56	4.71 (<.001)	-
	Decided-uncomfortable <sup>b</sup>	94	2.33±0.57		
	Decided-comfortable <sup>c</sup>	80	2.50±0.52		
	Undecided-comfortable <sup>d</sup>	8	2.19±0.68		
	Total	219	2.34±0.57		
Career decision making self efficacy	Undecided-uncomfortable <sup>a</sup>	37	4.01±0.56	13.24 (<.001)	c>a,b
	Decided-uncomfortable <sup>b</sup>	94	4.42±0.67		
	Decided-comfortable <sup>c</sup>	80	4.75±0.58		
	Undecided-comfortable <sup>d</sup>	8	4.18±0.59		
	Total	219	4.46±0.67		
Career adaptability	Undecided-uncomfortable <sup>a</sup>	37	3.85±0.59	10.13 (<.001)	c>d
	Decided-uncomfortable <sup>b</sup>	94	4.08±0.48		
	Decided-comfortable <sup>c</sup>	80	4.33±0.48		
	Undecided-comfortable <sup>d</sup>	8	3.74±0.46		
	Total	219	4.12±0.52		

SD=standard deviation

higher for the undecided-uncomfortable than for the decided-comfortable profile; however, there were no significant differences in preparation. The mean self-efficacy score was higher in the decided-comfortable than undecided-uncomfortable and decided-uncomfortable profiles. The mean adaptability score was higher for the decided-comfortable than the undecided-comfortable profile.

## Discussion

This study examined CDPs of nursing students and identified the differences in barriers, preparation, self efficacy, and adaptability to provide evidence for developing profile-specific career education programs.

The most common profile was decided-uncomfortable, and the least common was undecided-comfortable. These results were consistent with previous studies on students in other majors [17,25] but contradicted Jones and Chenery [18], who found decided-comfortable to be the most prevalent (42.5%). Furthermore, our results differed from Jung's [16] findings of the undecided-uncomfortable profile (39.5%) as the most common and decided-uncomfortable (7.0%) as the least common among nursing students. Nevertheless, the undecided-uncomfortable profile was the most prevalent in Jung's [16] study, whereas the decided-uncomfortable profile was the most common in this study. However, Jung [16] collected study data before the COVID-19 pandemic. A decline in employment confidence was evident among college students in this study, as they witnessed the shrinking job market and faced prolonged job searches [26]. This social atmosphere resulted in nursing students pursuing stability in their career decisions rather than exploring various career options –potentially explaining our higher decidedness level results compared to Jung's [16]. Moreover, the decided-uncomfortable profile in the present study highlights students' heightened discomfort regarding their career decisions and indicates the need for career exploration activities and counseling intervention. Providing nursing students reassurance, information regarding specific career paths, mentorship opportunities, and field visits with working nurses could help increase comfort in career decisions.

Moreover, 46.5% of Jung's [16] participants were reportedly uncomfortable, regardless of their CDP, compared to 59.8% in this study. The COVID-19 pandemic caused anxiety and depression among 48.0% of the Korean population [27], and the

psychological impact was, by age group, greatest among the socially and economically active youth [28]. Discomfort in career decisions among nursing students increased after the pandemic, suggesting that their identities related to nursing were not fully established, and some were unstable and immature decision-makers. Individuals with decided career choices but unclear professional self concepts expressed discomfort with their career decisions [25]. Making career decisions without sufficient exploration can lead to discomfort regarding CDP.

Those in the decided-uncomfortable profile demonstrated lower autonomy in their career decisions compared to those in the decided-comfortable profile, suggesting that those in the decided-uncomfortable profile may have made their career decisions based on external factors rather than intrinsic motivations [16]. Therefore, developing and implementing career counseling programs that can alleviate career discomfort among nursing students in the post-COVID-19 period and provide intrinsic motivation to enhance autonomy in career decision making is crucial.

This study revealed that only 34.1% of the participants chose nursing based on their aptitude and preference, whereas 45.2% and 6.9% chose it due to the high employment rate and recommendation by parents or other people, respectively. Hence, our results may indicate that students who chose nursing without considering their aptitude and preferences felt uncertain about their career paths [16]. Therefore, providing ongoing individual career counseling to nursing students from the freshman can help them identify their aptitude and preference, foster their adaptation to the nursing program, and develop a professional identity and mission.

The CDPs differed significantly by school year and extracurricular activities. These results contradict previous findings of high percentages of senior students in the undecided-uncomfortable and decided-uncomfortable profiles (32.9% and 50.0%, respectively), freshman and sophomore students in the undecided-comfortable profile (40.6% each), and junior students in the decided-comfortable profile (33.3%) [16]. In this study, the percentages of students with a decided-uncomfortable profile were similar across nursing program years. Thus, many students who made career decisions were uncomfortable with those decisions. Emotional comfort level regarding one's decision is not solely dependent on the CDP but is influenced by their attitude and perception toward their career [17]. Therefore, studies are needed to develop tailored career counseling for nursing students that considers their



individual emotional profiles and, as recommended by Jung [16] to support those who exhibit psychological discomfort.

The 24.5% of senior students who made career decisions but had discomfort about them highlight the employment-related pressure and stress that senior students face regardless of their CDP. Thus, career education should be provided from the freshman to foster career confidence in nursing students.

Moreover, approximately half of the undecided-uncomfortable students did not engage in extracurricular activities, unlike those in decided-uncomfortable and decided-comfortable profiles. These results suggest that many students who engage in extracurricular activities have chosen their careers regardless of their comfort level. Extracurricular activities, such as school clubs and part-time jobs, positively impact school studies among college students [29], and such participation promotes cognitive and emotional growth [29]. Believing in one's capabilities and expecting positive outcomes from a task engages individuals in activities and motivates them to practice them further with a set goal. Thus, in order to facilitate effective career decision making among nursing students, it is crucial to consistently offer student counseling and guidance, motivating them to actively participate in a wide range of extracurricular activities that foster personal growth and enrichment.

Preparation, self-efficacy, and adaptability decreased with increased barriers, whereas self-efficacy and adaptability increased with greater preparation. Additionally, adaptability was higher with higher self-efficacy. These results are similar to previous findings of positive correlations between preparation and self-efficacy among university students, and between preparation and adaptability, and between self-efficacy and adaptability [10]. Our results were consistent with previous findings that self-efficacy and barriers are negatively correlated [30]. Motivating learning strategies, guidance, and intervention from faculty advisors could enhance preparation, self-efficacy, and adaptability among nursing students; they also encourage active exploration of career options and preparation for career roles. Moreover, students should be given opportunities, such as career counseling and education, that lower their barriers; assist them in translating their goals into concrete, stepwise plans; and evaluate their progress to proactively manage environmental factors that may hinder career development.

We also found that barriers, preparation, self-efficacy, and adaptability differed significantly across CDPs, which supports previous findings about decided-comfortable profile students [17].

Nursing students need high self-efficacy, adaptability, and low-barrier perceptions to comfortably determine their career path. Thus, tailored career counseling programs and coaching should consider these factors to enhance students' career decision comfort. In addition, based on our analysis of career decision types, the career preparation behavior of nursing students can be improved by actively utilizing the online self-introduction program and customizing employment education programs used in the COVID-19 pandemic, as in the study by Shin [6].

This study had some limitations. First, our findings cannot be generalized to the entire nursing student population, as well utilized cross-sectional data from a convenience sample and most were female and junior or senior. Additionally, we could not identify personal characteristics, interests, and affective and cognitive factors experienced by nursing students during the career decision-making process. And this study has a limitation in that it was unable to investigate reasons for undecidedness by using only two of the three sub-elements of the original tool of CDPs. Accordingly, it is suggested that future research needs to conduct research that can investigate and analyze all three sub-elements of the original tool. Nevertheless, this study is significant because the sample was recruited from nursing students from two private universities in different regions. While future studies should expand regionally and physically to produce generalizable findings, this study provides a foundation for developing tailored career education programs based on CDPs among nursing students.

Nursing departments should periodically offer nursing curriculum information sessions to alleviate barriers related to major selection, develop confidence in decisions, and provide opportunities for students to network with current nursing professionals; such opportunities would increase their comfort regarding their careers. Furthermore, satisfaction must be promoted during clinical practicum experiences in the junior and senior before entering the workforce, as this can boost students' confidence and enhance their self-efficacy. It is crucial to improve students' adaptability through simulation classes to prepare them to cope effectively with anticipated situations as nursing professionals.

## Conclusion

Individualized career coaching programs tailored to nursing students' personal characteristics and areas of interest should be



developed and implemented from the freshman to the final year of nursing school. Additionally, frequent individual and group career counseling sessions that address the students' concerns and anxieties would lower their perceived barriers and improve their career preparation, self efficacy, and adaptability. Future studies should expand the study sample and regions to produce generalizable findings, evaluate the effectiveness of career education programs tailored to specific nursing student CDPs, and identify the factors that cause discomfort and prompt immature decisions among undecided-uncomfortable students.

## Author contributions

**YM Jung:** Conceptualization, Methodology, Software, Data curation, Writing - original draft, Visualization, Investigation, Supervision, Validation, Writing - review & editing, Funding acquisition. **YI Jung:** Conceptualization, Methodology, Software, Data curation, Writing - original draft, Visualization, Investigation, Supervision, Validation, Writing - review & editing.

## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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## Supplementary materials

None

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