

Prediction of academic burnout and academic performance based on the need for cognition and general self-efficacy: A cross-sectional analytical study

584

Predicción del agotamiento académico y rendimiento académico basado en la necesidad de cognición y autoeficacia general: un estudio analítico de corte transversal

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Abstract

One of the main challenges of nursing education is students' academic burnout due to the stressors associated with nursing practice. Therefore, identifying and predicting cognitive and motivational factors behind academic burnout and academic performance are of great importance. This study aimed to predict nursing students' academic burnout and academic performance based on the need for cognition and general self-efficacy and also to assess the mediation effects of the need for cognition and general self-efficacy. This was a cross-sectional analytical study. Two Faculties of Nursing and Midwifery in Shiraz and Rafsanjan, Iran. A sample of 337 bachelor's nursing students. Data were collected using a demographic and academic characteristics questionnaire, Cacioppo and Petty's Need for Cognition Scale, Sherer's General Self-Efficacy Scale, and Maslach's Burnout Inventory-Student Survey. Academic performance was also measured based on students' grade point average. Data analysis was performed via Pearson correlation analysis, simple and multiple regres-

sion analyses, and Sobel test equation for mediation effects. Analyses revealed the significant positive correlation of general self-efficacy with the need for cognition and academic performance as well as the significant inverse correlation of academic burnout with the need for cognition, general self-efficacy, and academic performance. However, the need for cognition was not significantly correlated with academic performance. Moreover, the need for cognition and general self-efficacy simultaneously predicted 16.8% of the variance of academic burnout, while only general self-efficacy was the significant predictor of academic performance, accounting for 3.5% of its total variance. General self-efficacy mediated the relationship of the need for cognition and academic burnout. Also, the need for cognition mediated the relationship of general self-efficacy and academic burnout ($P < 0.001$). Interventions for improving students' self-efficacy and need for cognition can help reduce their academic burnout and improve their academic performance.

Keywords: attitude, disasters, nurse, predictive factors.

Antecedentes: uno de los principales desafíos de la educación en enfermería es el agotamiento académico de los estudiantes debido a los factores estresantes asociados con la práctica de enfermería. Por lo tanto, la identificación y la predicción de factores cognitivos y motivacionales detrás del agotamiento académico y el rendimiento académico son de gran importancia. Este estudio tuvo como objetivo predecir el agotamiento académico y el rendimiento académico de los estudiantes de enfermería basándose en la necesidad de cognición y autoeficacia general, y también evaluar los efectos de mediación de la necesidad de cognición y autoeficacia general. Este fue un estudio analítico transversal. Dos facultades de Enfermería y Partería en Shiraz y Rafsanjan, Irán. Una muestra de 337 estudiantes de Licenciatura en Enfermería de licenciatura. Los datos se recopilieron mediante un cuestionario de características demográficas y académicas, la Escala de Necesidad de Cognición de Cacioppo y Petty, la Escala de Autoeficacia General de Sherer y la Encuesta de estudiantes de Burnout Agotamiento Académico de Maslach. El rendimiento académico también se midió con base en el promedio de calificaciones de los estudiantes. El análisis de los datos se realizó mediante el análisis de correlación de Pearson, análisis de regresión simple y múltiple, y la ecuación de prueba de Sobel para los efectos de mediación. Los análisis revelaron la correlación positiva significativa de la autoeficacia general con la necesidad de cognición y rendimiento académico, así como la correlación inversa significativa del agotamiento académico con la necesidad de cognición, autoeficacia general y rendimiento académico. Sin embargo, la necesidad de cognición no se correlacionó significativamente con el rendimiento académico. Además, la necesidad de cognición y autoeficacia general predijo simultáneamente 16.8% de la varianza del agotamiento académico, mientras que solo la autoeficacia general fue el predictor significativo del rendimiento académico, representando el 3.5% de su varianza total. La autoeficacia general medió la relación entre la necesidad de cognición y el agotamiento académico. Además, la necesidad de cognición medió la relación entre la autoeficacia general y el agotamiento académico ($P < 0,001$). Las intervenciones para mejorar la autoeficacia y la necesidad de cognición de los estudiantes pueden ayudar a reducir su agotamiento académico y mejorar su rendimiento académico.

Palabras clave: Necesidad de cognición, autoeficacia general, agotamiento académico, rendimiento académico, estudiantes de enfermería.

Students' academic performance (AP) refers to their measurable and observable activities in specific situations such as examinations. It is directly correlated with academic achievement¹ and hence, its measurement is of great importance². There are different criteria for AP measurement, the most common of which is grade point average. AP is determined by different factors such as personality traits, motivation, self-regulated learning strategies, learning styles, academic burnout (AB) and psychosocial contexts³⁻⁵.

AB is a significant factor behind nursing students' AP and turnover intention⁶. First described in 1995 by Beck⁷, AB is a psychological syndrome which includes physical, emotional, and psychological depletion⁸. It is caused by chronic academic stress induced by heavy course load⁹, personality traits, inadequate social support¹⁰, inadequate peer support, ineffective peer interactions, ineffective interpersonal communications, uncertainty over the future¹¹, ever-changing clinical environment, separation from family, financial concerns, and frequent evaluations¹². AB is manifested by emotional exhaustion, cynicism, reduced self-efficacy (SE), reluctance to do homework⁹, depression, anxiety, aggression, physical and psychological burnout, despair, and frustration¹⁰. AB, in turn, can result in stress, academic procrastination, poor AP, absences from work^{11,13}, poor learning outcomes¹, inability to complete academic courses, tendency toward neglecting academic activities, lower professional maturity, and lower readiness for work¹⁴. Moreover, AB is associated with lower job satisfaction and motivation, higher risks for health problems, greater social conflicts, functional problems, fatigue, insomnia, alcohol and drug abuse¹⁵, negative college experiences, and lower quality of life¹¹.

The need for cognition (NFC) is another potential factor behind students' AP^{16,17}. As a permanent personality trait, NFC is defined as internal motivation for seeking intellectual challenges and engaging in and enjoying cognitive activities such as reflection, abstract thinking, and problem solving¹⁸. People with higher NFC have greater desire for seeking, acquiring, thinking, reflecting, and understanding stimulators, motivators, relationships, and events in their surroundings¹⁶. They are more likely to use rational discussions, are more open to ideas¹⁹, process data for making judgments²⁰, and find greater enjoyment in problem-solving activities, with no sense of depletion¹⁷. Contrarily, people with low NFC do not enjoy cognitive attempts and prefer to rely on others' beliefs in complicated situations²¹. University education is a demanding task which necessitates intense intellectual activities and therefore, students with greater NFC have better feelings in challenging academic settings²².

SE is another factor which may contribute to AP. It is a motivational characteristic which has positive relation-

ships with abilities and motivations²³. It aims at creating a constant sense of competence for effective action in a wide range of stressful situations²⁴. It stems in Bandura's Social Cognitive Theory and is conceptualized as a general self-evaluation of cognition, emotion, and motivation²⁵. SE is associated with higher levels of motivation, perseverance, and stability²⁶, helps control thoughts, feelings, and actions and hence, affects one's motivations for progress, learning, and academic achievement²⁷. It is a good predictor of nursing students' performance in clinical settings²⁸, so that students with higher SE are more likely to engage in challenging activities which promote their learning and clinical skills²⁹. Besides, SE acts as a psychological resource which may reduce the probability of AB⁸. It regulates students' performance cognitively, motivationally, socially, and effectively and affects the way people face and manage challenges, problems, and failures³⁰.

Previous studies reported different results respecting the correlations among AP, AB, NFC, and SE. For instance, two studies found a small correlation between NFC and AP^{22,31}. Two other studies also found that NFC was inversely correlated with stress¹⁶ and depressed mood¹⁷. Moreover, a study on medical school students showed that perfectionism and SE explained 54% of the total variance of AB⁸. Two studies also revealed that SE is significantly correlated with AB^{3,30}. A systematic review also showed that academic SE is moderately correlated with AP³². Yet, there is a paucity of researches on the relationship of NFC and SE^{2,23,33}, particularly in nursing. Moreover, there is limited information regarding the effects of NFC and SE on AP and AB. In addition, most previous studies in the area of the relationship between SE and burnout have mainly dealt with job burnout among practicing nurses^{24,34}, leaving nursing students' burnout almost unknown³⁵. To fill these gaps, the present study was done with the aim of predicting AP and AB based on NFC and general SE (GSE) among nursing students.

Design: This was a cross-sectional analytical study.

Sample and setting: The population of the study comprised all 402 bachelor's nursing students in Shiraz and Rafsanjan, Iran. All students were recruited to the study through census in September–December 2016. They were included if they did not work as employees in clinical settings and agreed to participate in the study. Of course, first-semester nursing students were not included and those who partially answered data collection tools were excluded.

Data collection tools: In addition to a questionnaire on students' demographic and academic characteristics, the following three tools were also used for data collection.

1. Cacioppo and Petty's Need for Cognition Scale (NFCS): NFCS is an eighteen-item self-report scale for NFC assess-

ment. Items are scored on a five-point 1–5 scale, on which 1 and 5 stand for "Completely disagree" and "Completely agree", respectively. Higher NFCS scores reflect greater NFC. The developers of the scale reported that NFCS Cronbach's alpha was 0.9 and noted that many studies supported its convergent and discriminant validity³⁶. The Persian NFCS was also found to have satisfactory construct validity and reliability, with a Cronbach's alpha of 0.83³⁷. Cronbach's alpha of the scale in the present study was 0.87.

2. Sherer's General Self-Efficacy Scale (SGSES): This scale contains seventeen items scored on a five-point scale from 1 ("Completely disagree") to 5 ("Completely agree"). Higher scores show stronger SE beliefs and vice versa. Sherer et al. confirmed the construct validity of the scale and reported a Cronbach's alpha of 0.86 for it³⁸. The Persian adaptation of SGSES was also reported to have a Cronbach's alpha of 0.83 and acceptable criterion and construct validity³⁹. In the present study, SGSES Cronbach's alpha was 0.90.

3. Maslach's Burnout Inventory-Student Survey (MBI-SS): This scale was developed for the assessment of students' AB. It contains fifteen items in three subscales, namely emotional exhaustion (five items), academic cynicism (four items), and reduced SE (six items)⁴⁰. Higher scores stand for severer burnout. We used the Persian MBI-SS, which was reported to have acceptable content, convergent, and discriminant validity, internal consistency, and test-retest stability⁴¹. Its Cronbach's alpha in the present study was 0.91.

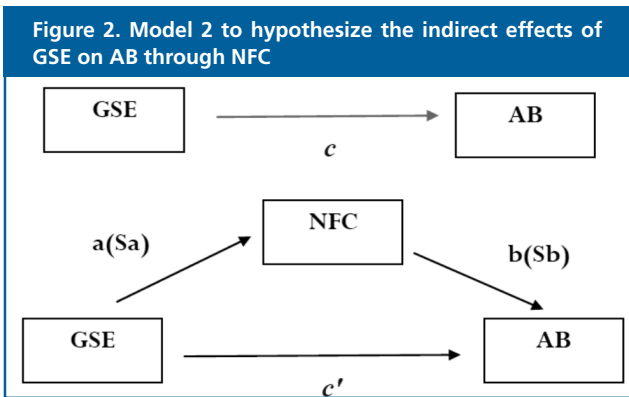
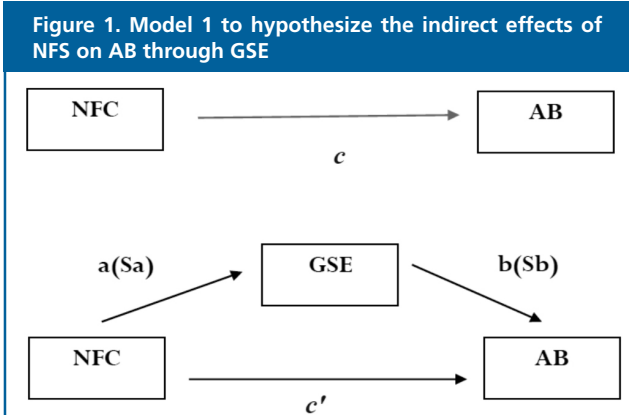
Together with a cover letter, all data collection tools were given to each student at the same time and he/she was asked to complete them in a single session. The cover letter provided students with information about the study aim, their rights in the study, and anonymous data collection and analysis solely for the purpose of the present study. Informed consent was also obtained from each student.

Data analysis: The data were entered into the SPSS for Windows program (v. 22.0), where they were described using descriptive statistics and analyzed via Pearson correlation analysis and simple and multiple regression analyses. Moreover, the mediation effects of the NFC and GSE on AB were assessed through the Sobel test equation developed by Preacher and Hayes. They recommended that mediation models can be used when the following four conditions are satisfied:

1. The independent variable significantly affects the mediator variable;
2. The independent variable significantly affects the dependent variable in the absence of the mediator variable;
3. The mediator variable has significant exclusive effects on the dependent variable; and
4. The effects of the independent variable on the dependent variable are reduced (partial mediation) or be-

come statistically insignificant (complete mediation) in the presence of the mediator variable⁴²⁻⁴⁴.

Figures 1 and 2 show mediation models. In these figures, path c shows the total effects of the independent variable on the dependent variable and path c' shows the effects of the independent variable on the dependent variable, with the effects of the mediator variable being controlled. The indirect effects of the independent variable on the dependent variable are exerted through the mediators.



a = raw (unstandardized) regression coefficient for the association between the independent variable and the mediator.

s_a = standard error of a.

b = raw coefficient for the association between the mediator and the dependent variable (when the independent variable is also a predictor of the dependent variable).

s_b = standard error of b.

Results

From 402 students who were approached, 337 completed the study. The means of their age and grade point average were 21.67 ± 2.92 years and 15.40 ± 1.43 (on a 0–20 scale), respectively. Most students were female (56.4%) and single (83.7%), lived in college dormitories (63.5%), and had a medium financial status (57.9%). Table 1 shows their demographic and academic characteristics.

Table 1. Students' demographic and academic characteristics

Characteristics		N (%)
Gender	Male	147 (43.6)
	Female	190 (56.4)
Academic year	First	64 (19.0)
	Second	99 (29.4)
	Third	116 (34.4)
	Fourth	58 (17.2)
Place of residence	Home	123 (36.5)
	Dormitory	214 (63.5)
Marital status	Single/divorced/widowed	282 (83.7)
	Married	55 (16.3)
Financial status	Good	110 (32.6)
	Moderate	195 (57.9)
	Poor	32 (9.5)

Correlation analyses revealed that GSE had significant positive correlations with NFC and AP. Moreover, AB had significant inverse correlations with NFC, GSE, and AP. Similarly, NFC and GSE were found to have significant inverse correlations with the three subscales of AB. Besides, AP had significant inverse correlation with the reduced SE subscale of AB and no significant correlations with the other two dimensions, i.e. emotional exhaustion and academic cynicism. The correlation of NFC and AP was statistically insignificant (Table 2).

Table 2. The matrix of correlations among study variables

Variable	Mean±SD	NFC	GSE	AB	AB subscales			AP
					EE	AC	RE	
NFC	3.38±0.45	1						
GSE	3.56±0.55	0.427 [†]	1					
AB	2.53±0.94	-0.289 [†]	-0.394 [†]	1				
EE	2.62±1.20	-0.192 [†]	-0.224 [†]	0.863 [†]	1			
AC	2.40±1.29	-0.208 [†]	-0.300 [†]	0.877 [†]	0.742 [†]	1		
RE	2.53±0.97	-0.318 [†]	-0.458 [†]	0.761 [†]	0.408 [†]	0.478 [†]	1	
AP	15.40±1.43	0.058 [^]	0.194 [†]	-0.136 [*]	-0.072 [^]	-0.066 [^]	-0.196 [†]	1

*: P < 0.05; †: P < 0.001; ^: P > 0.05

NFC: Need for Cognition; GSE: General Self-Efficacy; AB: Academic Burnout; EE: Emotional Exhaustion; AC: Academic Cynicism; RE: Reduced Academic Efficacy; AP: Academic Performance

Multiple regression analysis showed that GSE and NFC simultaneously explained the variances of AP, AB, along with the reduced SE, academic cynicism, and emotional exhaustion subscales of AB by 3.3%, 16.8%, 22.3%, 9.2%, and 5.6%, respectively ($P < 0.001$). Moreover, GSE and NFC each explained respectively 15.2% and 8.1% of the total variance of AB, with GSE as the stronger predictor. In addition, GSE was the only significant predictor of AB, accounting for 3.5% of its total variance (Table 3).

Sobel test equation revealed that GSE partially mediated the relationship of NFC and AB (test statistics = -5.782 ; $SE = 0.059$; $P < 0.001$; $c = -0.595$; $c\phi = -0.304$; Figure 1). Moreover, NFC was a significant partial mediator of the GSE-AB relationship (test statistics = -4.644 ; $SE = 0.045$; $P < 0.001$; $c = -0.673$; $c\phi = -0.565$; Figure 2). Findings showed that the effect size of NFC on AB reduces to half its original size in the presence of GSE, while the effect size of GSE on AB reduces only slightly in the presence of NFC. Therefore, the mediation effect of GSE on AB was much greater than the mediation effect of NFC. It is noteworthy that in the relationship of GSE and NFC with AP, one of the principal conditions (i.e. the significant relationship of NFC with AP) was not satisfied; therefore, determining the mediator variable was impossible.

Table 3. The results of the simple and multiple linear regression analyses for assessing the effects of NFC and GSE on AB and AP

Criterion variables	Predictors	Unstandardized Coefficients B		Standardized Coefficients	t	F	Sig.	Adjusted R Square
		Std. Error	B	β				
AB	GSE	0.086	-0.673	-0.394	-7.836	61.403	0.000	0.152
	NFC	0.108	-0.595	-0.289	-5.515	30.420	0.000	0.081
	GSE	0.094	-0.565	-0.331	-6.007	34.844	0.000	0.168
	NFC	0.114	-0.304	-0.147	-2.675		0.008	
AP	GSE	0.139	0.504	0.194	3.616	13.078	0.000	0.035
	NFC	0.171	0.183	0.058	1.069	1.143	0.286	0.000
	GSE	0.154	-0.537	0.207	3.482	6.652	0.000	0.033
	NFC	0.186	0.094	-0.030	-0.505		0.614	

Discussion

This study showed that NFC was positively correlated with GSE. This is in line with the findings of previous studies in this area^{2,23,33}. Greater NFC is associated with improved SE and vice versa. When a person enjoys certain tasks and actively searches for them (known as NFC), he/she is more confident in his/her ability to perform them (known as SE). Moreover, a person who is confident in his/her cognitive abilities has probably great NFC².

NFC in this study significantly explained part of the variance of AB. This finding can be attributed to the fact that NFC satisfactorily predicts the motivation for accepting intellectual challenges. In other words, people with greater NFC are more willing to modify their performance based

on the difficulty of the tasks or problems⁴⁵ and are less likely to be negatively affected by that difficulty⁴⁶. Moreover, they can more effectively evaluate the characteristics of the demands and can more accurately assess the need for using accessible resources to fulfill the demands²⁰. Consequently, they are less likely to experience burnout. In other words, in the face of cognitive challenges, NFC helps people generate better outcomes, not only through enhancing their motivation for overcoming challenges, but also through enabling them to have more positive evaluations of the challenges²². NFC reduces occupational stress, positively affects work and life, and facilitates access to appropriate resources¹⁷.

Our findings also showed that GSE was an important predictor for AB. Similarly, previous studies reported the inverse correlation of GSE with AB^{3,8,47,48}. The Social Cognitive Theory holds that emotional stimulation or SE affects students' feelings, thoughts, motivations, behaviors⁴⁹, burnout, perception of their own abilities to perform a task⁴⁸, and perceived stress and success in doing a task⁵⁰. SE also improves attitudes and performance during challenges and difficulties, promotes emotional well-being, and reduces vulnerability to stress, burnout, and depression⁵¹. People with great SE consider difficult tasks more as growth opportunities than as potential threats⁵². On the contrary, low SE requires people to magnify problems and therefore, is associated with stress, depression, and poor problem-solving ability⁵⁰.

We also found that AP was not significantly correlated with NFC but had significant correlation with GSE, so that GSE significantly explained 3.5% of AP total variance. The results of previous studies into the relationship of NFC with AP are contradictory. For instance, some studies reported weak to moderate relationship between NFC and AP²² and also the ability of NFC to predict academic achievements¹⁶. However, another study showed that the effects of NFC and AP are mediated by SE, so that NFC is not a significant predictor of AP in the presence of SE. This finding may be due to the fact that students who enjoy and actively engage in educational academic activities are more confident in their abilities and therefore, have better AP². In fact, students' expected educational outcomes greatly depend on their judgment about their abilities, i.e. SE⁵³. Other studies also showed that students' SE is significantly correlated with their motivation, AP, and academic achievement^{53,54}. SE, in turn, is believed to exert its effects through improving motivation, commitment, and perseverance⁵⁵. Students with great SE are able to abandon ineffective strategies, solve more problems, and work on difficult problems; therefore, they have better academic performance compared to those with lower SE⁴⁹.

Another finding of the present study was the small, significant correlations of AP with AB and its reduced SE subscale. In line with our findings, several studies reported negative correlation between AP and AB^{48,56}. An explanation for this finding is that burnout reduces the sense of success¹² and the motivation for attempt⁵⁷. Moreover, it is

associated with the use of ineffective learning strategies, concerns over marks, futile educational endeavors, and perceived heavy workload. Students who perceived that they have inadequate power, energy, and resources to deal with educational expectations, avoid accepting new responsibilities and roles, participate in learning activities hopelessly, indifferently, and reluctantly, or may even reject participation. Indifference, apathy, and fatigue are known to negatively affect students' AP, academic achievement, and ability to fulfill educational expectations and gradually make them feel less empowered and more frustrated⁵⁶. In contradiction to our findings, a study reported that only the academic cynicism subscale of AB was inversely correlated with academic achievement⁵⁸, and two other studies found no significant correlation between AP and AB^{59,60}.

Sobel test equation in the present study also indicated that NFS and GSE had partial mediation effects in their relationships with AB. SE is an internal coping style which can reduce burnout⁴⁷. NFC is also an important personality trait¹⁶ which is associated with emotional reactions such as emotional coping and thereby, it supports students in dealing with academic demands and challenging situations²². Besides, in difficult educational situations, high SE helps students participate actively and work hardy. Such tendency for active participation and hard work is remarkably similar to the interest of people with high NFC in dealing with cognitive activities² and difficult situations as well as to their enjoyment in effortful thinking²². In line with our findings, previous studies also reported that ability and motivation, like SE, can affect the effects of personal traits such as NFC²³. NFC is also a significant trait which can affect motivation-related attributes like SE⁶¹. Cacioppo and Petty also noted that high NFC improves SE, while Bandura held that SE improves NFC². We assume that not only NFC and SE predict AB, but also the effects of NFC on AB are mediated by the effects of NFC on GSE and vice versa. Of course, the mediation effects of SE on AB (Figure 1) are much greater than the mediation effects of NFC on AB (Figure 2). Such results have been seen in various studies⁶²⁻⁶⁵.

In this study, we could not assess the mediation effects in the relationships of NFC and GSE with AP because one of the principal conditions of mediation was not fulfilled. However, in an earlier study, NFC-AP relationship was mediated by GSE, while GSE-AP relationship was not mediated by NFC. That study concluded that high NFC improves SE and thereby, affects academic achievement².

Conclusions

This study suggests that GSE and NFC can reduce AB and improve AP. Therefore, developing and implementing interventions to improve students' GSE and NFC can help significantly reduce their AB and improve their AP.

Limitations and Recommendations: One limitation of this study was the fact that students needed to complete four questionnaires in a single session which might have been tiring for them and might have affected their responses to questionnaires. Moreover, AP was assessed solely via grade point average, which may not adequately reflect the complex meanings of AP and academic achievement. In addition, this was a cross-sectional study in which dependent and independent variables were measured simultaneously; therefore, it cannot provide credible information about causal relationships among variables. Further studies with longitudinal designs are needed to confirm the findings of the present study. Moreover, further studies are needed to determine other factors affecting NFC, GSE, AP, and AB.

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