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Nursing Students' Education Stress and Academic Achievement: The Impact of Three Different Education Methods

Hemşirelik Öğrencilerinin Eğitim Stresi ve Akademik Başarısı: Üç Farklı Eğitim Yönteminin Etkisi

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ABSTRACT

Nursing education has both theoretical and practical components as well as many stressors. The stress levels of students might be affected by clinical environment, nursing practices, patients, and team members. The aim of this study was to determine the effect of stress on nursing students' academic achievement related to three different education methods. A descriptive and cross-sectional study was conducted with 571 nursing students at three universities. A different education method was used at each university. Data were collected by researchers using the Individual Identity Form and Stress in Nursing Education Questionnaire. According to the education methods, there is a difference between the academic achievement mean score and the academic stress score of the students. Academic stress was weakly correlated with academic achievement in the integrated model and Problem Based Learning. Problem Based Learning decreases stress level and increases the academic achievements of students by enabling them to realize the different capabilities of the study.

Keywords: Nursing students, Nursing education, Academic achievement, Stress

ÖZ

Hemşirelik eğitimi, teorik ve pratik bileşenlerinin yanı sıra çok sayıda stresöre sahiptir. Öğrencilerin stres düzeyleri klinik ortamdan, hemşirelik uygulamalarından, hasta ve ekip üyelerinden etkilenebilir. Bu çalışmanın amacı, üç farklı eğitim yönteminde, hemşirelik öğrencilerinin akademik başarıları üzerine stresin etkisini belirlemektir. Tanımlayıcı ve kesitsel tipteki çalışma, üç üniversitede 571

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hemşirelik öğrencisi ile yürütülmüştür. Her üniversitede farklı bir eğitim yöntemi kullanılmaktadır. Veriler, araştırmacılar tarafından Birey Tanıtım Formu ve Hemşirelik Eğitimi Stres Ölçeği kullanılarak toplanmıştır. Eğitim yöntemlerine göre öğrencilerin akademik başarı puan ortalamaları ve akademik stres puanları arasında fark vardır. Entegre model ve Probleme Dayalı Öğrenimde akademik stres ile akademik başarı arasında zayıf ilişki vardır. Probleme Dayalı Öğrenme, stres düzeyini azaltır ve öğrencilerin farklı yeteneklerini gerçekleştirmelerini sağlayarak akademik başarılarını artırır.

Anahtar Sözcükler: Hemşirelik öğrencileri, Hemşirelik eğitimi, Akademik başarı, Stres

INTRODUCTION

Nursing education has stressors that increase nursing students' anxiety levels. The studies have shown that the stress levels of nursing students increase throughout their education (Timmins, Corroon, Byrne, & Mooney, 2011). Jiménez, Martínez, and Vacas (2010) found similar stress levels in all three training years in nursing students. It has been suggested that the risk of developing mental health problems is higher for nursing students compared to other health disciplines and the general population (Luo & Wang, 2009; Rhead, 1995; Timmins et al., 2011). The stress levels of nursing students might be affected by the instructor, clinical environment, nursing practices, patients, team members and by him or herself. It is found that stress is related to insufficient theoretical training, lack of skills in clinical practice, taking responsibility of the patients, time pressure, lack of motivation and accommodation, social life, new responsibilities and living in a new environment (Öner & Üstün, 2013, Seyedfatemi, Tafreshi, & Hagani, 2007). For nursing education three main stress groups defined in systematic review study of Pulido-Martos, Augusto-Landa & Lopez-Zafra (2012): (i) Academic stressors (exam evaluation, anxiety of failure in education, etc.), (ii) clinical stressors (atychiphobia, negative reaction to death or patient pain, relation with team members, etc.), (iii) personal/social stressors (economic problems etc.). It's known that nursing students that undergo stress on their education negatively affected both on their health and professional personality development. Stress also affects academic success of students negatively as breaking their thinking and decision taking capabilities (Karaca, Yıldırım, Ankaralı, Açıkgöz, & Akkuş, 2015).

The academic achievement of students is very important to the students themselves, as well as to their parents and society. It is known that academic achievement is related to many factors, such as cognitive performance, capability, personality and family characteristics (Khalaila, 2015). Furthermore, in a study conducted in Australia, it was found that for most students who were working 16 hours per week in a job related to nursing, as their working hours increased, their academic achievement decreased (Salamonson & Andrew 2006). In the literature it was declared that academic achievement of nursing students increases as the quality of facilities that clinical studies conducted increases (Aktaş & Karabulut, 2016). Also it was declared that self-motivation, high sense of self and exam anxiety were affecting factor on academic achievement (Khalaila, 2015). In the literature, it was found that there was relationship between students' academic achievement and their stress level (Elias, Ping, & Abdullah, 2011; Öner & Üstün, 2013; Pulido-Martos, Augusto-Landa, & Lopez-Zafra, 2012; Yıldırım, Karaca, Ankaralı, Açıkgöz, & Akkuş, 2016). The stress disrupts students' critical thinking and decision-making abilities and therefore reduces academic achievement (Elias et al., 2011; Yıldırım et al., 2016).

Nursing education, including theoretical and practice course hours, is determined by the Council of Higher Education in Turkey. While all nursing schools receive their education based on certain standards, the specific models they experience might differ. Essentially three main nursing education models are used in Turkey.

Traditional-classical education model: The students are the passive role in this education model. It is a teacher-centered method because it is the teacher who determines the content of the course and tells lessons to large groups of students (Lewis et al., 2009; Seren & Ustun, 2008). This method is preferred by most nursing schools in Turkey. In addition to theoretical lectures, clinical and laboratory education is also provided. Students attend clinical practices together with theoretical lectures starting from the first class.

Integration model: This model is based on holistic learning. This model groups subject areas according to a problem or issue. Because nursing problems are interdisciplinary and solving problems integrates many areas of knowledge, more and more importance has been given to the integration model in nursing education. Integration is classified as either horizontal or vertical. Horizontal integration elucidates an issue/problem in more than one discipline at a time, whereas vertical integration shows the relationship between disciplines at different stages of the education. Integrated education programs in nursing are structured from health to disease as related subject areas to be included basic knowledge, attitudes and capabilities (Karagözoğlu, Özden, & Tok-Yıldız, 2013; Sabanciogullari & Dogan, 2012; Toraman, Temel, Kalkım, & Balyacı, 2013). The integrated method has been used in Turkish nursing schools since 1999. In the integrated education model, active education methods are used and nursing skills training are given at laboratories and clinics. Besides these, students at the third class participate in clinical practices.

Problem-based learning model: This method was first applied in a Turkish nursing school in 1999. Problem-based learning (PBL) is one of the student centered education approach. In the literature it was reported that it is an effective method to increase academic achievement and to develop critical

thinking skills such as interpret knowledge, conducting a research, creative thinking and problem solving. Also it was reported that it was effective on increasing self-sufficient belief and self-management. (Cónsul-Giribet & Medina-Moya, 2014; Dagistani, Al Hejaili, Binsalih, Al Jahdali, & Al Sayyari, 2016; Lewis et al., 2009; Yalcin, Karahan, Karadenizli, & Sahin, 2006; Seren & Ustun, 2008).

The effect of different nursing education models on students: There were studies in the literature that have analyzed the effect of different nursing education models on students. It was reported in the literature that the conflict resolution (Seren & Ustun, 2008), problem solving (Yalcin et al., 2006) skills and critical thinking disposition (Dagistani et al., 2016; Lewis et al., 2009) of students were higher in PBL education and PBL had a stronger influence on development of students' self-perceptions regarding information literacy (Özbıçakçı, Gezer, & Bilik, 2015).

Studies in the literature (Jiménez et al., 2010; Karagözoğlu et al., 2013; Luo & Wong, 2009; Öner & Üstün, 2013; Pulido-Martos et al., 2012; Seyedfatemi et al., 2007; Watson, Deary, Thompson, & Li, 2008) mainly focused on one method and analyzed its effect on students' academic and/or clinical stress. There is not any study in the literature that analyzed the stress resulting from different education models and its effect on students' academic achievements. The aim of this study was to determine the effect of stress on nursing students' academic achievement related to three different teaching methods. The research question for the study: What is the effect of stress on the academic achievement of nursing students in different education methods?

METHOD

Study Group

The descriptive and cross-sectional study was conducted with nursing students at three different universities, where each used a different education method, between 15 February and 15 May 2015 in Izmir, in Turkey. Nursing students of state universities in the city center of Izmir were accepted in the study to take in the control stress and factors (environmental factors, socio-economic factors etc.) that might affect academic success. Research was conducted in three state universities that were using different techniques on undergraduate nursing education. Undergraduate nursing education programs were given in four years within eight semesters. The sample size was calculated with the known sampling universe formula at a confidence level of 95% (Erdoğan, Nahcivan, & Esin, 2014). 630 students, who were started clinical applications, were invited in the study with a randomly sampling method. 46 of them didn't accept to participate in the study and 13 of them were not accepted in the study because of missing information on their forms. Based on this calculation, 171 students were selected from a university with a classical traditional education, 198 students were selected from a university that used the integrated education method and 202 students were selected from a university that used the problem based education method. In total, 571 students participated in the study.

Instruments

Data were collected by using the Individual Identity Form that was generated by researchers regarding the literature (Elias et al., 2011; Jiménez et al., 2010; Karagözoğlu et al., 2013; Öner & Üstün, 2013; Pulido-Martos et al., 2012; Yıldırım et al., 2016) and by using Stress in Nursing Education (SINE) Questionaire that was developed by Rhead (Rhead, 1995). The data were collected by face-to-face interviews conducted by researchers. Students declared their academic achievements regarding their grade-point average on their transcripts.

The Stress in Nursing Education Questionnaire (Rhead, 1995) is a modified version of the Nurse Stress Scale, which incorporates academic stressors and was designed specifically for use within nursing education. The Turkish reliability validity of the scale was made by Karaca, Yıldırım, Ankaralı, Açıkgöz and Akkuş (2014) and it was declared that it was a valid and reliable tool on determining academic and practical stress of nursing students through their undergraduate education. The questionnaire of the four-point likert type consists of 32 items. The points that can be taken from the questionnaire range from 0 to 96. Karaca et al. found the Cronbach's alpha for practical stress subscale was 0.84, academic stress subscale was 0.83 and total scale was 0.90. For this study, the Cronbach's alpha for practical stress subscale was 0.87 and academic stress subscale was 0.86, the total scale was 0.92.

Data Analysis

The Statistical Package for Social Science (SPSS Version 21.0) was used for data analysis. Sociodemographic characteristics of students were analyzed by descriptive statistics (number, percentage and mean) and variance between groups was analyzed by Chi-square test. ANOVA test was used to analyze difference between SINE score and academic achievement mean score of students regarding their different education methods. If statistically significant difference was found, Tukey HSD was used for further analysis. Correlation analysis was used to look up relation between students' academic achievement mean score and SINE score.

Ethical Procedure

Ethical board permission (Date: 2 February 2015; No: 22) was given before the start of the study, and written permissions of the universities were also given. The researchers received the written of participants prior to the study.

RESULTS

The demographic data were presented in Table 1. There was no difference regarding the gender of students in three groups that participated in the study, but the mean age (F=33.810, p=0.000) and year of the class (x^2=13.457, p=0.001) were statistically different for the three groups (Table 1). Also regarding to their education type there is no statistically meaningful difference between students on their income level, their parents' education level and employment status (p>0.05).

The academic achievement score and SINE of the participants in the three groups were given in Table 2. The academic achievement score of the students in the PBL method was higher compared to other techniques and the least score was in integration model. The difference between them was statistically significant (F=112, p=0.00). It was determined by the Tukey HSD test that the difference came from the PBL model. Academic stress subscale, practical stress subscale and SINE total score of students in PBL model were less compared to both integration model and traditional-classical education model. When traditional-classical education model and integration model compared, academic stress subscale, practical stress subscale and SINE total score of students in traditional-classical model were less compared to students in integration model. Statistically significant difference between education models was found only for academic stress subscale score (F=3.099, p=0.046). It was determined by the Tukey HSD test that the difference came from the PBL model. There was not any statistically significant difference between the groups regarding either the SINE total score or the practical stress subscale score (p>0.05) (Table 2).

There was a weak negative correlation between the academic achievement score and academic stress sub-scale score of students in the integration model (r=-0.142, $r2$=0.020, p=0.046) and the PBL model (r=-0.162, $r2$=0.026, p=0.021). There wasn't relationship between the academic achievement and the SINE total score (r=0.036, p=0.640) and the sub-scale score of academic stress (r=-0.038, p=0.625) and practical stress (r=0.100, p=0.192) (p>0.005) in traditional- classical method (Table 3).

Table 1: The Sociodemographic Characteristics of Students*

Variables		Traditional-Classical Method (n=171)	Integration Method (n=198)	Problem Based Learning (n=202)
Mean Age (Mean±Standard Deviation) (Years) F/*p*		21.35±1.35	22.65±1.83 F=33.810 *p*=0.000	22.33±1.43
Gender	Female	138 (80.7)	175 (88.4)	173 (85.6)
	Male	33 (19.3)	23 (11.6)	29 (14.4)
	x^2/*p*		x^2=4.343 *p*=0.114	
Class*	Second	80 (46.8)	-	62 (30.7)
	Third	47 (27.5)	108 (54.5)	55 (27.2)
	Fourth	44 (25.7)	90 (45.5)	85 (42.1)
	x^2/*p*		x^2=13.457 *p*=0.001	

**Second class of students was not included in the statistical analyses because there were no second-class students in the integration method.*

Table 2: Academic Achievement and SINE Score Regarding the Education Methods

	Traditional-Classical Method (n=171)	Integration Method (n=198)	Problem Based Learning Method (n=202)	*F/p*
Academic Achievement Mean Score	2.79±0.38	2.65±0.30	3.09±0.18	*F*=112.161 *p*=0.000
SINE Total Score	67.50±13.43	68.17±16.69	65.59±16.90	*F*= 1.413 *p*=0.244
Academic Stress Score	34.63±7.02	35.26±8.77	33.19±9.31	*F*= 3.099 *p*=0.046
Practical Stress Score	32.86±7.46	32.91±8.68	32.40±8.52	*F*= 0.231 *p*=0.794

SINE: *Stress in nursing education.*

Table 3: Correlation of Academic Achievement and SINE Score Regarding the Education Methods

	Academic Achievement Mean Score	Academic Stress Score	Practical Stress Score	SINE Total Score
Traditional–Classical Method (n=171)	2.79±0.38	*r*=-0.038 *p*=0.625	*r*=0.100 *p*=0.192	*r*=0.036 *p*=0.640
Integration Method (n=198)	2.65±0.30	*r*=-0.142 *p*=0.046	*r*=-0.064 *p*=0.370	*r*=-0.108 *p*=0.130
Problem-Based Learning Method (n=202)	3.09±0.18	*r*=-0.162 *p*=0.021	*r*=-0.045 *p*=0.523	*r*=-0.112 *p*=0.113

SINE: *Stress in nursing education.*

DISCUSSION

High-level stress in nursing education might result in low motivation in learning and low academic achievement in students (Öner & Üstün, 2013, Seyedfatemi et al., 2007; Wolf et al., 2015). Stress in clinical practice negatively affects the performance and academic achievement of students (Karaca, Yıldırım, Ankaralı, Açıkgöz, & Akkuş, 2014; Salamanson & Andrew, 2006; Taşdelen & Zaybak, 2013). In this study, which analyzed whether there was a difference in the stress and academic achievement levels of nursing students educated in three different education models, it was determined that the academic achievement of students in the PBL model was higher compared to those in the traditional-classical and integrated models. It was found that the total academic achievement of students in the PBL group was higher. Özbıçakçı, Gezer and Bilik (2015) reported that information literacy of students was higher in the PBL method, and Dagistani et al. (2016) declared that the critical thinking ability of PBL students was better. Since the academic achievement of the students in the PBL method was found to be higher, the main affecting factors were thought to be critical thinking, self-education, and information literacy and combined learning capabilities. Also it's thought in the study that difference between students university entry scores might be an affecting variable on their academic success. But it is a constraint of this study that groups were not homogenized regarding this variable.

Regarding the education methods, there was no difference between the total score of the SINE and the sub-scale score of clinical stress. In the study of Karagözoğlu, Özden and Tok Yıldız (2013), which was conducted to measure clinical stress in the integrated education model, it was found that the clinical stress level of students was less, and that this was the result of the integrated education model as because it is centered on the student. In another study conducted by Taşdelen and Zaybak (2013) in an integrated model nursing school, it was found that students' practice stress was at a medium level, and the reported affecting factors that increased their stress were the clinical nurses and lecturers. Atay and Yilmaz (2011) conducted a study to measure practice stress in a traditional-classical nursing school, and they found that students' stress level was high. With three different education models in use in Turkey, the clinical practice model is almost the same in each model. Beside this, the factors affecting clinical stress were the inherent elements of clinical practice, such as the clinic's environment, team, patient, new atmosphere and nursing applications. Clinical training of students that this study was conducted with was at the same hospitals, so clinical training stress level was similar for all three education models as expected. A low level of stress in practice is important, because it can increase student's academic achievement and support a secure learning environment.

In this study, it was determined that the academic stress level of PBL students was lower compared to the other groups. Lewis et al. (2009) conducted a study with medical students in UK to analyze the effect of PBL and non-PBL education models on their stress level. In this study it was found that the PBL students were more likely to feel that they did not know what the faculty expected from them, complain about an unclear curriculum. Although a high level of stress was expected because of student's active participation in PBL, it actually causes less stress and higher academic achievement and higher motivation because it gives students the freedom to define their own learning targets, and it requires regular and planned study (Cónsul-Giribet & Medina-Moya, 2014; Dagistani et al., 2016). PBL also brings out the different capabilities of nursing students, and such capabilities might decrease the stress level of the students. For example, it was found that the conflict resolution (Seren & Ustun, 2008; Yalcin et al., 2006) and problem solving (Yalcin et al., 2006) skills of students were better with PBL

Nursing students experience stress factors that negatively affect their academic achievement and quality of life from the beginning of their education (Aktaş & Karabulut, 2016; Karagözoğlu et al., 2013). In this study, it was found that the academic achievement of students under the PBL method and the integration model decreased as their academic stress increased. It was found there was no relationship between academic stress and academic achievement in the traditional-classical education model. Mohamed, Khletet and Al Awany (2012) found in their study that stress negatively affects the academic achievement of nursing students. In Goff's study (2011) it was found that age, not stress was an important factor affecting academic achievement. A high level of stress disorder thinking and decision-making capabilities of students and decreases their academic achievement.

CONCLUSIONS

It is important for nurses to get their professional knowledge, capabilities and values through their nursing education. Because of this, factors affecting their stress level in their education have to be determined and clearly defined to minimize the stress level. It was determined in this study that the method used in their education was an affecting factor for their stress level and academic achievement. Academicians should support students in all educations models regarding clinical and academic point of view and should determine stress causing issues earlier. So students will be less affected by these stressing factors and their academic achievements will increase.

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