Original Article

Predictors of the academic stress and its determinants among students based on the theory of planned behavior

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Abstract

Introduction: According to various researches, students suffer from enormous stress during their studies. If the stress intensifies or continues, it will create problems in mental health and well-being. The purpose of this study was to investigate predictive and effective factors of academic stress among students based on the theory of planned behavior.

Materials and Methods: The statistical community of this descriptive-analytic study consist all students of Ferdowsi University of Medical Sciences. Amongst them 320 students selected randomly. Data collection was done using demographic, academic stress of Gadzella and researcher based on the theory of behavioral behavior questionnaire that its validity and reliability were confirmed. Data were analyzed by SPSS software version 16 and related statistical tests.

Results: There was a significant relationship between academic stress, gender ($P<0.05$) and educational level ($P<0.001$). Based on Spearman's correlation coefficient, there was a significant positive correlation between knowledge and academic stress ($r=0.201$, $P<0.001$). Subjective norms ($r= -0.177$, $P<0.05$) and perceived behavioral control ($r= -0.261$, $P<0.001$) has reverse relationship. Also, the results of regression showed that the theory of planned behavior in general predicted 14.7% variance of students' academic stress which knowledge and perceived behavioral control has significant effect on them ($P<0.001$).

Conclusion: The results of this study suggested that the use of the theory of planned behavior in educational interventions on perceived behavioral control structure may be effective in academic stress.

Keywords: Academic Stress, Students, Theory of planned behavior

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Introduction

Stress is defined as the negative emotional experience and tension in the face of an internal or external factor (1). The results of recent research suggest that the level of stress and its complications has been on rise in people's life, raising concerns of many institutions and organizations, including the World Health Organization. It has been shown that after common musculoskeletal disorders, the main reason for visiting physicians is for problems related to stress and depression (2). Therefore, stress is experienced by all individuals and it should be noted that a degree of stress could be effective in stimulating and improving performance (3), but its high levels may give rise to a plethora of consequences, including physical and mental illness (4), impaired academic performance (5), lower immunity (6) and decreased longevity (7).

One of the most sensitive stages of life is the youth, where individuals undergo a transition from adolescent irresponsibility into adherence to specific life styles, but they may also face obstacles and problems that be the source of stress in this process (8). According to various research findings, students undergo considerable stress during their studies, and stress is associated with multiple psychological and social problems in these individuals (9). Stress may manifest as physical injuries, chronic energy shortages, reduced motivation, headache, digestive problems, and sleep problems. Some researchers argue that anxieties and depression are involved in stress-related reactions (10).

In this context, academic stress, if intensified or sustained, can give rise to several problems in terms of mental health and well-being of student. Academic stress describes the growing need for knowledge and, at the same time, an individual's perception of the insufficient time to acquire that knowledge. With regard to academic stress, special emphasis has been placed on five stressful factors (failures, conflicts, pressures, changes and self-imposed stress) and four types of reactions (physiological, behavioral, cognitive, and emotional) (11). Foruzandeh et al. in a research on the relationship between academic stress and the quality of life found that with increased stress level, the quality of life declines in all aspects, so that it can be argued that students' academic stress can adversely affect their quality of life (12). In addition, Fouladvand et al. in their study on the relationship between social support, academic self-efficacy, academic stress and mental and physical health concluded that higher levels of mental health and physical health were predicted by higher scores of social support while lower academic stress acted as a predictor of academic self-efficacy (13). Studies have shown that high levels of stress in students can lead to impaired thinking process, perception and problem solving abilities as well as sleep disturbances and diminished decision-making power. Therefore, it is important to investigate academic stress in students to mitigate its adverse outcomes (14).

The results of meta-analyses of the planned behavior theory have shown that the theoretical structures of the theory of planned behavior can predict the intention and subsequently the behavior itself. The main reason for engaging in a certain behavior is the intention to do so. An individual's behavioral intention is a function of his attitude towards the behavior and mental norms associated with that behavior. In other words, the behavior of a person depends on his attitude towards a particular behavior and how others perceive that behavior, especially those figures that are deemed as important in the society. Both of these are determinants that may affect a person's intention to engage in a certain behavior. The third factor is perceived control, which is associated with the availability of conditions and facilities for adopting the desired behavior (15).

Therefore, considering the importance of youth psychological well-being and the necessity of identifying factors influencing behavior based on theoretical principles, it is necessary to detect the most effective structures involved in creating these direct or indirect effects, so that effective educational interventions can be designed and programmed. The purpose of this study is to investigate the predictive factors of academic stress and its determinants among students based on the theory of planned behavior.

Materials and Methods

This is a descriptive-analytical study. The population consists of all students of Ferdowsi University of Mashhad in the academic year 2016-17. Given that educational stress was the main variable of this study and a first type error of 0.05 was considered, we determined the sample size of the descriptive study based on the

study of Gholamali Lavasani et al. (16) According to this study, s=11.3 and d=2.5, and a sample size of n=80 was obtained for each faculty based on the following formula. Since the population of this study was limited to four faculties, a sample size of n=320 was estimated.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}}\right)^2 (s)^2}{(d)^2}$$

After obtaining permission from Mashhad University of Medical Sciences and making arrangements with Ferdowsi University, 4 faculties (Theology, Engineering, Administrative and Economic Sciences, Basic Sciences) were randomly selected. Then, from each faculty, 80 students were randomly selected based on the gender and academic level and recruited for the study. The inclusion criteria consisted of students studying in faculties that offered all three undergraduate, postgraduate and PhD programs, willingness to participate in research and no history of mental illness. The exclusion criteria covered students studying in faculties of Education Science and Psychology, and partial completion of the questionnaires. The instruments used in this study included demographic questionnaires, academic stress scale and a self-administered questionnaire.

Research instrument

A) Demographic data: This questionnaire comprised of information about the major and academic degree, age, gender, marital status and residence status of subjects.

B) Academic Stress Scale: The academic stress was measured by Gadzla questionnaire (1998) with a measured internal validity of r= 0.71 (17). This instrument was designed to explore stressors in a student life and their reactions to these factors. It is a self-reporting questionnaire which consists of 51 items rated on a 5-point Likert scale. It is divided into 9 subscales: 1) failures; 2) conflicts; 3) stresses; 4) changes; 5) self-imposed stress; 6) physiological stress; 7) emotional stress; 8) behavioral stress; and 9) cognitive stress.

In each subscale, the overall score was computed by aggregating points for each item. Higher scores indicated higher academic stress and greater stress response (17). The validity and reliability of this scale was confirmed by Shokri et al. (2009) in Iran (18).

C) Self-administered questionnaire based on the constructs of the theory of planned behavior:

Based on the subject of research, a questionnaire was designed by drawing on reliable sources. The questions related to knowledge were adapted from a book entitled "Stress and how to deal with it" (19). Also, questions concerned with the constructs of the theory of planned behavior were designed by drawing on studies that had incorporated the theory, such as the ones by Vafaeevajar (15) and Peyman et al. (20) as well as consulting respective professors. The content validity method was used to assess the validity of the research. The questionnaire was distributed among 9 health education professionals and their comments and views were incorporated to modify the questionnaire. The reported values for CVR and CVI indices were at the desirable range. Also, the reliability of the instrument was determined by Cronbach's alpha. To do so, the questionnaire was given to 30 students who had not participated in the main study. An alpha coefficient of 0.85 was achieved for the questionnaire. The questionnaire addressing the constructs of the theory of planned behavior was designed on a 5-point Likert scale (1= strongly disagree and 5= strongly agree). It consisted of 5 items on attitude (e.g. managing stress by gaining higher scores in exams), 4 items on subjective norms (e.g. the family helps me to stay calm during the exams), 5 items on perceived behavioral control (e.g.: I look at the bright side in the face of stressful situations and I think about good results) and 4 items on behavioral intention (e.g. I intend to avoid stress by doing my homework and assignments on time). Further, to assess the level of knowledge (e.g. stress causes gastric ulcer) 5 items (on a scale of Yes, to some extent, No) were used, which were scored 0, 1, and 2, respectively. The scores range for different constructs of attitudes (5-25), subjective norms (4-2), perceived behavioral control (5-25), behavioral intention "(4-20) and knowledge (0-10) was obtained. The questionnaires were filled out by research centers in a self-reporting manner over a period of 15 to 10 min. After undertaking sampling, data were entered into the SPSS 16 software. Data analysis was performed using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (independent t-test, Spearman correlation coefficient and one-way ANOVA) at a significant level 0.05. Moreover, to determine the effect of knowledge and constructs of attitudes, perceived behavioral control and subjective norms, as independent

variables, on academic stress, linear regression analysis was used to assess stress and their predictive power. The ethical codes approved by the research committee of the University of Medical Sciences relevant to the study subject were observed. The most important of these codes were: gaining permission from the research centers, explaining the objectives of the study to participants and ensuring participants about the confidentiality of their information.

Results

In Table 1, the frequency distribution of demographic variables in the sample is shown. According to the results, 51.2% of subjects were female. Most participants were in the age group of 18-28 years (88.2%), and only 11.8% were over 29 years old. 49.9% of subjects studied at undergraduate program and the majority of them were single (78.8%) and native (76.7%).

Table 1. Frequency distribution of demographic variables in research units

Variable		Number	Percent
Sex	Boy	156	48.8
	Girl	164	51.2
Age categories	28 – 18	232	88.2
	38 – 29	29	11.0
	48 - 39	2	0.8
Grade	Undergraduate	163	50.9
	Masters and PhD	157	49.1
Marital status	Single	249	78.8
	Married	67	21.2
Residence status	Native	244	76.7
	Non-native	74	23.3

Table 2 shows mean and standard deviation of academic stress for demographic variables. According to the findings, the mean of academic stress was 130.57 ± 25.29 in female students and 12.06 ± 23.26 in male students, which was statistically significant ($P> 0.05$). The mean of academic stress was 133.12 ± 25.48 in undergraduate students and 2.25 ± 22.10 in post-graduate and doctoral students, which were significantly different ($P<0.001$).

The academic stress was not significantly correlated with marital status, residence status and age groups ($P<0.05$).

With regard to scores of constructs related to the theory of planned behavior, the mean score of subjects was 20.76 ± 3.38 for attitude, 13.62 ± 3.26 for subjective norms, 84.4 ± 4.17 for perceived behavioral control, 14.12 ± 3.13 for behavioral intention and 6.7 ± 2.23 for knowledge.

Table 2. Mean and standard deviation of academic stress for demographic variables

	Academic stress	M	SD	T	P
Sex	Girl	130.57	25.29	$t^* = -2.023$	0.04
	Boy	125.06	23.26		
Grade	Undergraduate	133.12	25.48	$t^*=3.99$	<0.001
	Masters and PhD	122.45	22.10		
Marital status	Single	128.39	24.89	$t^* =0.6$	0.5
	Married	126.21	22.92		
Residence status	Native	127.74	23.74	$t^* = -0.017$	0.9
	Non-native	127.80	26.59		
Age categories	28 – 18	127.90	24.64	$f^{**}= 0.736$	0.4
	38 – 29	132.21	22.27		
	48 - 39	142.50	17.67		

* Independent t-test   ** One way-Anova

In Table 3, the correlation between the constructs of the theory of planned behavior and academic stress is shown. The results of Spearman's correlation coefficient suggested

that knowledge ($P<0.001$, r= 0.21) had a significant positive relationship with academic stress while subjective norms ($P<0.05$, r= -0.177) and perceived behavioral control (r = -

0.261, *P*<0.001) were in a significant negative relationship with academic stress. Also, according to findings, attitude and behavioral

intention were not significantly correlated with academic stress (*P*<0.05).

Table 3. Correlation between the constructs of the theory of planned behavior and academic stress

Variable	Spearman correlation coefficient	P
Knowledge	0.201	<0.001
Attitude	-0.068	0.2
Subjective norms	-0.177	0.002
Perceived behavioral control	-0.261	<0.001
Behavioral intention	-0.048	0.3

Table 4 also shows the results of the correlation between the constructs of the theory of planned behavior. As can be seen, knowledge is significantly correlated with attitude (r= 0.152) and subjective norms (r= 0.124, *P*<0.05). Attitude is also significantly correlated with subjective norms (*P*<0.001, r= 0.346), perceived behavioral control (r= 0.353, *P*<0.001) and behavioral intention (r= 0.428; *P*<0.001). There is also a positive significant relationship between subjective norms and perceived behavioral control (r=0.47, *P*=0.001)

and behavioral intention (*P*=0.001, r=0.446). Further, perceived behavioral control is significantly correlated with behavioral intention (*P*<0.001, r=0.440). However, no significant relationship was observed between knowledge, perceived behavioral control and behavioral intention.

Demographic variables were able to explain 9.1% of variance in academic stress, among which gender variables (*P*<0.05), academic degree (*P*<0.001) and age groups (*P*<0.05) had a significant effect on academic stress.

Table 4. Correlation between the constructs of the theory of planned behavior

Variable	knowledge r_s (p)	attitude r_s (p)	subjective norms r_s (p)	perceived behavioral control r_s (p)	behavioral intention r_s (p)
Knowledge	1				
Attitude	0.152 (0.007)	1			
Subjective norms	0.124 (0.02)	0.346 (<0.001)	1		
Perceived behavioral control	0.052 (0.3)	0.353 (<0.001)	0.437 (<0.001)	1	
Behavioral intention	0.099 (0.07)	0.428 (<0.001)	0.446 (<0.001)	0.404 (<0.001)	1

Table 5 shows the results of linear regression analysis for effect of Knowledge and attitudes, subjective norms and perceived behavioral control on academic stress. Based on the results, knowledge and constructs of the theory of planned behavior predicted 14.7% of variance in the academic stress among which knowledge and perceived behavioral control

had a significant effect on academic stress (*P*<0.001).

In addition, 31.5% of the dispersion in behavioral intention could be explained by knowledge and constructs of the theory of planned behavior, among which attitude, subjective norms and perceived behavioral control had a significant effect (*P*<0.001).

Table 5. Linear regression for effect of constructs of the theory of planned behavior on academic stress

Dependent variable	independent variable	Beta	P	r^2
	Knowledge	0.242	0.000	0.147
	Attitude	0.022	0.7	
Academic stress	Subjective norms	-0.080	0.1	
	Behavioral intention	0.247	0.000	

Discussion

The purpose of this study was to investigate the factors predicting academic stress and its determinants in students based on the theory of planned behavior. In this study, the findings revealed a significant relationship between student gender and academic stress so that female students had more academic stress. Shokri et al. revealed that female students experienced greater stress in comparison to male students, and they reported higher scores at four subscales of stressors (failure, pressure, changes and self-imposed stress) (21). The study of Shokri et al. also showed that there was a significant relationship between gender and academic stress, and the overall score of academic stress in female students was higher than their male counterparts (10). However, these results are not consistent with the findings reported by Abazari et al. according to which there was not any significant difference between male and female students in this regard (22). This discrepancy could be explained in terms of the sample size of the studies. In the study of Abazari et al. there were 274 subjects out of whom 91.2% were females and 8.8% were males. Also, in the study of Abazari et al. (22), the sample was selected from nursing students, while in the present study, the participants came from four faculties and different disciplines. Based on the results of this study, there was a significant relationship between stress and academic degree, so that the stress level in undergraduate students was higher than that of postgraduate and PhD students. Low stress in postgraduate and PhD students could be ascribed to their experience and familiarity with the university's atmosphere and how exams are administered.

The transition from high school to university, separation from the family and lack of familiar with the rules and academic atmosphere, among other things, can impose huge stress on undergraduate students. In keeping with the present study, Nikanjam et al. in their study on the stressors of student life and its related factors in Hamedan University of Medical

Sciences concluded that there was a significant relationship between academic degree and stress. Undergraduate students were more stressed than postgraduate and doctoral students (23). Furthermore, in this study, academic stress was not statistically significant among age groups, which is consistent with the study of Abazari et al. (22) and Nikanjam et al. (23). The results of correlation revealed that knowledge had a significant positive relationship with academic stress, so it can be argued that greater knowledge and knowledge about the complications and outcomes of stress can increase the probability of stress incidents in individuals.

The perceived behavioral control and subjective norms had a significant negative correlation with academic stress, meaning that by increasing subjective norms and behavioral control, the stress level of subjects could be reduced. The significant correlation between subjective norms indicated that important people in an individuals' life could largely influence their attitude and behavior.

According to the findings, among the variables of the theory of planned behavior, knowledge and perceived behavioral control had a significant predictive power with regard to the academic stress. Also, constructs of attitude, subjective norms and perceived behavioral control possessed a significant predictive power in regard to the behavioral intention. Unfortunately, few studies have investigated the relationship between academic stress and the theory of planned behavior; nevertheless, the results of many studies confirm that the constructs of this theory could be a significant predictor of behavior and behavioral intention. In this line of research, Vafaei et al. showed that perceived behavioral control was a predictor of the intention to play computer games in adolescents (15). Also, the results of a study by Saber et al. demonstrated that attitude and subjective norms were strong predictors for the intention to engage in physical activities (24). Almoradi et al. revealed that attitude and perceived behavioral control

had the highest predictive power with regard to the intention of verbal violence and physical violence, respectively (25). In the study of Solhi et al. the results of linear regression showed that the two constructs of attitude and perceived behavioral control were significantly related to the intention of responsible behavior for health, spiritual health and interpersonal relationships in female students, and they could predict 35% behavioral intention changes (26). The results of this paper are consistent with the findings reported in these studies.

There are many studies supporting the idea that perceived behavioral control possess a structure comparable to that of self-efficacy. In other words, constructs of perceived behavioral control and self-efficacy are conceptually overlapping, and consistent with Bandura's hypothesis, perceived self-efficacy can be considered as a prerequisite of behavior (27). Self-efficacious people maintain a positive belief about their abilities to engage in the desired behavior and they even can resume their behavior after a short interruption. Thus, self-efficacious individuals are more likely to put their intention into action (27).

This study had a number of limitations. Data was collected in a self-reporting manner, which may not be reflective of the actual performance of individuals. PhD students were less willing to complete the questionnaire than were students at other academic degrees, and therefore there were fewer PhD students participating in our study. Given the time and implementation restrictions of the researcher, this research was limited to the students of Ferdowsi University and students of other universities such as Payam-e-Noor, Azad, etc. were not included in the study.

Conclusion
The present study revealed a significant relationship between constructs of the theory of planned behavior, academic stress and behavioral intention. In general, the results suggested that the theory of planned behavior could be a good predictor of behavioral intention. Thus, it is necessary to consider these relationships when designing educational interventions. Additionally, based on the results, gender variable also played a crucial role in the study of academic stress and psychology professionals and academic counselors should pay specific attention to designing and organizing more efficient prevention and treatment programs

Acknowledgement

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