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The Relationship Between Perceived Stress and Computer Technology Attitude: an Application on Health Sciences Students

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ABSTRACT

Introduction: The aim of this study is to define attitudes of students in health sciences towards perceived personal stress and computer technologies, and to present the relationship between stress and computer technology attitudes. **Methods:** In this scope, this study has a descriptive nature and thus a questionnaire has been applied on 764 students from Afyon Kocatepe University Health Sciences High School, Turkey for data gathering. Descriptive statistics, independent samples, t test, one way ANOVA, and regression analysis have been used for data analysis. **Findings:** In the study, it is seen that female (=3,78) have a more positive attitude towards computer technology than male students (=3,62). according to the results of regression analysis of the study, the regression model between computer technology attitude (CTA) and perceived stress (PS) has been found meaningful (F=16,291; p<0,005). There was a negative relationship between computer technology attitude and perceived stress (when computer technology altitude increases, perceived stress decreases), and an increase of one unit in computer attitude results in 0.275 decrease in perceived stress. **Conclusions:** it can be concluded that correct and proper use of computer technologies can be accepted as a component of overcoming stress methods.
Key words: Perceived stress, computer technology attitude, health sciences students

1. INTRODUCTION

Stress is a response to changes in the environment as perceived by the individual (1). Moderate stress can be beneficial and stimulating, but severe and prolonged stress can have harmful physiological and psychological effects. The effects of various kinds of stress are cumulative on an individual (2).

Despite many studies on the relationship between stress and health, the nature of this relationship has not yet been clearly established. Some authors assert that stressful experiences are not limited to the realm of stressful life events, but also include the ongoing and difficult conditions of daily life, which some authors refer to as chronic stressors or stressors that tend to persist over long periods of time. It has also been found that there are wide individual differences in both cognitive and physiological responses to stress, and the relationship between stress and health is influenced by a variety of moderator variables, including personality, however findings have been inconclusive (3, 4) .

Generally, stressful events are thought to influence the pathogenesis of physical disease by causing negative affective states (e.g., feelings of anxiety and depression), which in turn exert direct effects on biological processes or behavioral patterns that influence disease risk. Exposures to chronic stress are considered the most toxic because they are most likely to result in long-term or permanent changes in the emotional, physiological, and behavioral responses that influence suscep-

tibility to and course of disease (5-8).

Coping can be defined as the thoughts and behavior an individual uses to manage internal and external demands of situations that are appraised as stressful (9, 10). Coping strategies are here defined as conscious volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances. Such resources involve two dimensions of the person: firstly the internal dimensions, which is linked to personal variables, age and gender, secondly, the external dimensions, linked to actions that are taken to cope with the demands of an external specific situation or sociocultural environment. Both dimensions are intertwined, and by doing so they are predisposing individuals to a particular and characteristic behavior (11).

Coping skills are considered as influential in the promotion of children's and adolescents' development, as the coping strategies used by school students to deal with a specific situation reflect a higher or lower degree of adaptation skills and psychological welfare (12). Coping may consist of behavioral or cognitive responses that are designed to reduce, overcome, or tolerate the demands placed on the individual, known as coping strategies.

The elicitation of the relaxation response in the presence of a stressor has been shown to be an effective treatment. "The relaxation response is perhaps best understood as a psycho-physiological state of hypo-arousal engendered by a multi-

tude of diverse technologies (e.g., meditation, neuromuscular relaxation) (13). As suggested there are a variety of techniques [technologies] that can engender the relaxation response. Positive effects of computer use were also listed, such as efficiency, access to information, fun and recreation, the ease of keeping up social contacts, and access to social support (13). Computers are now a part of everyday life, with the majority of daily activities involving the use of technology (14). Today's college students were born during the computer technology explosion and usually have adequate computer skills necessary to adapt to the changes in technology.

The aim of this study is to define attitudes of students in health sciences towards perceived personal stress and computer technologies, and to investigate the relationship between stress and computer technologies usage.

2. METHODS

2.1. Data collection and Samples

Data have been collected through questionnaire method in this study which has a descriptive method. This questionnaire consists of three parts. The first part of the questionnaire consists of questions related to some sociodemographic features of the participants and their computer usage habits. The second part of the questionnaire includes "computer technology attitude scale" developed by Yavuz (15) and the third part includes "perceived stress scale" developed by Cohen et al (16) and has been tested in Turkey by Esin et al. (17) for validity and reliability. 5 point Likert type evaluation (as strongly agree, agree, undecided, disagree, strongly disagree) has been used in computer technology attitude scale. In this scale, positive items have been graded as strongly agree=5 agree=4, undecided=3, disagree=2, strongly disagree=1, while for negative items inverted grading has been used (as strongly agree=1–strongly disagree=5). For stress scale, 5 point Likert type evaluation (as never=0, rarely=1, sometimes=2, frequently=3, always=4) has been used in order to determine the frequency of some events encountered in the last month.

The population of the study is students studying at Afyon Kocatepe University (AKU) Health Sciences High School (HSHS) and no sampling have been used because reaching the whole population has been aimed. In this frame, 1200 students studying at AKU-HSHS were given the questionnaire, out of which 843 returned. 764 questionnaires have been taken into evaluation after removing incomplete or wrong questionnaires.

2.2. Data analysis

The data has been evaluated with SPSS for Windows and socio-demographic features and some variables related to computer attitudes have been presented with frequency and percentile distribution. Descriptive statistics (percentile distribution, means and standard deviation) have been used for each item in computer technology attitude and perceived stress scales. Independent samples, t test, and one way ANOVA have been used for comparing computer technology attitude and perceived stress according to some personal features. The relationship between computer technology attitude and perceived stress has been defined with simple linear regression analysis. Computer technology attitude has been taken as independent variable and perceived stress as dependent variable in regression analysis.

3. RESULTS

Table 1 presents the distribution of students according to their sociodemographic features. According to this, 75% of the participants are female students and 25% are male. 14.3% of the students study Physiotherapy and rehabilitation (PTR), 17.7% nutrition and dietetics (NUT), 30.8% nursing (NUR), 37.3% health institutions management (HIM) (Table 1).

Variables/Groups	n	%	Variables/Groups	n	%
Sex			Mother's Education Level		
Female	573	75	Can read and write	45	5.9
Male	191	25	Primary school	390	51.0
Departments			Secondary school	132	17.3
Nutrition and Dietetics	135	17.7	High School	145	19.0
Physiotherapy and Rehabilitation	109	14.3	University	52	6.8
Nursing	235	30.8	Father's Education Level		
Health Management	285	37.3	Can read and write	11	1.4
Year			Primary school	235	30.8
1.	312	40.8	Secondary school	135	17.7
2.	146	19.1	High School	203	26.6
3.	180	23.6	University	180	23.5
4.	126	16.5	Mother's Profession		
High School graduation			Farmer, Worker, Self-employed	52	6.8
Anatolian/Science High School	411	53.8	Civil Servant	26	3.4
Ordinary High School	219	28.7	Retired	31	4.1
Vocational High School	104	13.6	Housewife	655	85.7
Theology Vocational School	11	1.4	Father's Profession		
Private High School	19	2.5	Farmer, Worker, Self-employed	384	50.3
Hometown			Civil Servant	189	24.7
Village/town	14	1.8	Retired	171	22.4
County	90	11.8	Does not work	19	2.5
Province	660	86.4	Total	764	100,0

Table 1. *Distribution of Students according to their Socio–Demographic features*

Table 2 presents that 84.6% of the students stated that they have their own computer and 33.1% have taken computer courses. 84.4% of the participants stated that they use com-

Variables	Groups	n	**%**
Owning a computer	Yes	646	84.6
	No	118	15.4
Taken a lesson at school	Yes	645	84.4
	No	119	15.6
Taken a computer course	Yes	253	33.1
	No	511	66.9
Daily computer usage	Yes	642	84.0
	No	122	15.8
Computer usage Period	1-3 hours	588	77.0
	4-6 hours	152	19.9
	7 and more hours	24	3.1
Total		764	100

Table 2. *Distribution of Students According to their Computer Usage*

ITEMS	Strongly Disagree	Disagree	Unde-cided	Agree	Strongly Agree	X	SD
	%	%	%	%	%		
Negative items							
1. E-mail is only for communication; it cannot be used in education.	26,6	42,0	11,5	11,1	8,8	3,66	1,23
2. OHP, slides and projection should not be preferred as they take too much time to be used.	27,7	42,7	12,7	11,3	5,6	3,76	1,14
3. Using technological tools does not affect students' motivation.	29,7	39,4	15,4	11,6	3,8	3,80	1,10
4. Technological tools do not need to be used in instruction.	11,4	23,2	25,0	31,5	8,9	3,03	1,17
11. One does not have to use technological facilities in order to be successful in life	34,8	41,5	9,3	8,8	5,6	3,91	1,14
Positive items							
5. Recording some parts of the lesson on videotapes could provide the students the opportunity to see their mistakes.	9,3	13,1	22,0	34,8	20,8	3,45	1,22
6. Technological tools could be used for practice or revision.	3,5	6,4	9,0	50,1	30,9	3,98	0,99
7. Students should receive basic education on computer literacy.	5,8	8,2	12,3	47,8	25,9	3,80	1,09
8. Using current technologies would promote the improvement of new ones.	2,5	5,2	7,9	45,7	38,7	4,13	0,94
9. Technological facilities have a positive effect on productive studying and learning.	2,9	5,8	12,6	46,9	31,9	3,99	0,97
10. Using technology would facilitate the understanding of difficult subjects.	2,2	6,8	15,2	47,4	28,4	3,93	0,95
12. In order to be able to graduate from the university, the ability to "use the technological materials of the field" should be rated.	4,1	13,1	27,0	38,7	17,2	3,52	1,05
GENERALLY						3,75	0,87

Table 3. *Descriptive statistics of computer technology attitude*

puter daily regularly. 77% of the students use computer between 1-3 hours every day, 19.9% 4-6 hours and 3.1% 7 and more hours (Table 2).

For computer technology attitudes of students, descriptive statistics have been presented. In Table 3, general average value of 3.75 shows that participants' computer technology attitude is positive because it is higher than the average level of 3 in 5 point Likert scale. Among negative items in computer technology attitudes, the fourth article "Technological tools do not need to be used in instruction" got the highest negative attitude (=3,03), while 11th article "One does not have to use technological facilities in order to be successful in life" got the highest positive respond (=3,91) from the other articles. While 34.6% of the participants responded to "Technological tools do not need to be used in instruction" article positively as strongly disagree or disagree, 40.4% of the participants showed a negative attitude with agree or strongly

agree. While 76.3% of the participants showed a positive attitude for "One does not have to use technological facilities in order to be successful in life" article by disagree or strongly agree, only 14.4% of the participants showed a negative attitude by agree or strongly agree (Table 3).

Inspection of descriptive statistics for positive articles in Table 3 show that while the 8th article "Using current technologies would promote the improvement of new ones" obtained the highest positive attitude (=4,13), the 5th article "Recording some parts of the lesson on videotapes could provide the students the opportunity to see their mistakes" obtained the highest negative attitude (=3,45). 7.7% of the participants responded negatively to "Using current technologies would promote the improvement of new ones" by strongly disagree or disagree, while 84.4% responded positively by agree or strongly agree. While 22.4% of the participants have a negative attitude to "Recording some parts of the lesson on

ITEMS	Never	Rarely	Sometimes	Frequently	Always	X	SD
	%	%	%	%	%		
In the last month, how often have you (been/felt)							
1. Upset by something happening unexpectedly?	11,9	21,7	39,7	20,8	5,9	1,87	1,06
2. Unable to control the important things in your life?	10,2	23,0	40,3	20,8	5,6	1,89	1,03
3. Nervous and stressed?	4,3	13,7	33,8	30,4	17,8	2,44	1,07
4. Dealt successfully with day-to-day problems and annoyances?	12,3	24,1	41,9	16,2	5,5	1,79	1,03
5. Effectively coping with important changes that were occurring in your life?	8,8	19,9	42,8	20,4	8,1	1,99	1,04
6. Confident about your ability to handle your personal problems?	5,8	17,9	35,2	28,7	12,4	2,24	1,07
7. Things were going your way?	13,6	29,1	36,6	15,3	5,4	1,70	1,05
8. Angered because of things that were outside your control?	8,8	20,5	34,9	24,7	11,0	2,09	1,11
9. Thinking about things that you have to accomplish?	11,6	25,7	39,7	17,4	5,6	1,80	1,04
10. Able to control the way you spend your time?	15,4	32,5	33,5	13,4	5,2	1,60	1,06
11. Difficulties were piling up so high that you could not overcome them?	13,1	13,2	15,7	6,4	1,6	0,70	1,05
GENERALY						1,83	0,89

Table 4. *Descriptive statistics about stress conditions of participants in the last month*

Variables	Groups	Mean	SD	t/F	p
Sex	Male	3,62	0,71	3,148	0,002★
	Female	3,78	0,55		
Computer ownership	Yes	3,76	0,58	2,863	0,004★
	No	3,59	0,66		
Mother's education level	Can read and write	3,65	0,54	2,527	0,040★
	Primary school	3,77	0,59		
	Secondary school	3,63	0,63		
	High School	3,72	0,62		
	University	3,89	0,53		

Table 5. *The relationship between Computer technology attitude and some demographic features*

Variable	β	SE	t	p	ANOVA
Constant	2,481	0,164	15,127	0,000★	16,291 0,000★
Technology attitude	-0,275	0,043	-4,236	0,000★	

Table 6. *Regression analysis between computer technology attitude and perceived stress*

videotapes could provide the students the opportunity to see their mistakes" by strongly disagree or disagree, 55.6% of the participants responded positively by agree or strongly agree.

Table 4 presents descriptive statistics about stress conditions of participants in the last month. A general evaluation of stress status in the last month showed that the students have an average of 1.83 perceived stresses. This figure is a little below the median 2 in perceived stress scale, so it can be evaluated as that the students do not have a very negative perceived stress, even can be read as positive. While the inspection of these statistics show that students responded "Nervous and stressed" most frequently ($\bar{x}$=2,44), the article which gathered the least frequent reply ($\bar{x}$=0,70) was "Difficulties were piling up so high that you could not overcome them" (Table 4).

The relationship between the influence of some personal features on computer technology attitude and perceived stress has been studied and significant ties have been discovered and presented in Table 5. According to this, computer technology attitude has a meaningful difference in terms of computer ownership, sex and education levels of parents. When the table is inspected, it is seen that female ($\bar{x}$=3,78) have a more positive attitude towards computer technology than male students ($\bar{x}$=3,62), and it is valid for computer owners ($\bar{x}$=3,76) to not owners ($\bar{x}$=3,59) and participants with university graduate mothers ($\bar{x}$=3,89) (Table 5).

In Table 6, according to the result of regression analysis, the regression model between computer technology attitude (CTA) and perceived stress (PS) has been found meaningful (F=16,291; p<0,005). In this frame, simple linear regression model can be founded as;

PS = 2,481 − 0,275 x CTA

According to this model, there is a negative relationship between computer technology attitude and perceived stress (when computer technology attitude increases, perceived stress decreases), and an increase of one unit in computer attitude results in 0.275 decrease in perceived stress (Table 6).

4. DISCUSSION

In this study, which aims to define the relationship between computer technology attitude and perceived stress, more than

¾ of the students mentioned that they have personal computers, have taken computer lessons at school at least for a term or more and use computer and internet everyday regularly. In addition to this, daily average computer usage has been calculated as 2.7 hours. Some studies on this area show differences in terms of computer ownership and internet connection rates (Atali et al. (18) %31.2, Keskin (19) %33,9, and Golge and Arli (20) (%71.9). Atali et al. (18) have mentioned that 42% of university students have taken basic level computer training; Keskin (19) observed 43.5% use computer a few days in a week, 17% everyday, 12.2% a few days in a week. In the study conducted by Mahmood (21) with 625 students from the University of Punjab, Pakistan, 70% of students mentioned that there is a computer at their homes, 39% mentioned that they use computer every day, %39 mentioned that they use it a few days in a week. Khan et al. (22) noticed that 31% of the respondents stated that they used internet daily, 26% twice a week, 24% weekly, and 19% monthly. In the study conducted by Uribe and Marino (23) on 162 dentistry students at University of Chile, 96.4% of students mentioned that they have a personal computer, 73.4% mentioned that there is an internet connection at their homes and all of them mentioned that they connect to internet at least once in a week.

The result of the analysis shows that computer technology usage rates in Turkey has risen when the results in previous studies in Turkey are taken into consideration. Popovich et al (24) compared attitudes towards computer usage by undergraduates from 1986 to 2005. They found that the importance and use of computers has increased dramatically over the last two decades.

In this study which inspects students' computer technology usage attitudes, it is found out that the participants have a moderate level positive attitude. It is observed that a majority of students responded positively to the question "Using current technologies would promote the improvement of new ones". Similar results have been found by some researchers (Mahmood (21); Inoue (25); Teo (26)). It is also found out that students have a positive attitude in the study conducted by Mahmood (21) which inspects computer technology usage attitudes of university students. In the same study, 90% of students responded positively to the question "allows us to have access to more information, causes us to constantly learn new things, and improves communication". Inoue (25) and Teo (26) expressed in their studies that university students' attitudes toward information technology were highly positive.

In the present study, it is found out that computer technology attitude has a meaningful difference according to the groups of sex, mother's education and computer ownership. It is observed that female students' computer technology attitude is more positive than the male students. This result supports the results of similar studies in Turkey (Askar and Umay (27); Cagirgan et al (28) ; Goktas (29)). Similarly, in the study named as "Gender, subject and degree differences in university students' access, use and attitudes towards information ICT" by Mahmood (21), it is observed that female students have a more positive attitude towards computer technologies. However, some studies (Inoue (25); Teo (26); Popovich et al. (24)) have found out different results. Inoue (25) studied 174 male and female students of the School of Education at University of Guam. There were no differences in students'

perceptions of computer technology experiences between females and males groups. Teo (26) found out that there was no significant difference in computer attitudes by gender although male students reported more positive attitudes towards the computer than female students. Popovich et al. (24) found out that males and females no longer significantly differ in their attitudes toward computers.

When the stress level of participants in the last months is generally evaluated, it is seen that the participants have near-moderate level of perceived stress and feel "nervous and stressed" frequently. Eswi and Youssri (30) investigated perceived stress among baccalaureate Saudi nursing students. Results of the study revealed that the overall mean of perceived stress as measured by PSS was 23.3 (SD = 4.7) which was moderate to high. Bhandari (31) conducted a similar study on 130 Nepalese university students which reported that the overall mean of perceived stress as measured by PSS was moderate to high, 26.5 (SD=8.00). In literature, health sciences students (nursing, dietetic etc.) have academic stressors such as midterm and final examinations and research papers. There may be lack of inclusion of personal issues or reactions to stressful situations and poor applicability to broad settings (30).

In this study, a negative relationship has been observed between computer technology attitude and perceived stress levels, and a unit increase in computer technology attitude results in a decrease of 0.275 in perceived stress levels. This finding means that activities related to computer technology can decrease stress. In other words, this finding proves that a student on a stressful day can decrease his/her perceived level by using technology more often since it provides social support through communication with their friends and families. Moreover, university students generally have academic stress. Academic workload, insufficient study times, midterm exams, clinic workload are considered as stress factors for health sciences students (32). To be successful, they often must use highly technical equipment for clinical application and preparatory work. It can be thought that frequent use of computer technologies can be influential in reducing stress levels.

Teo (26) found out that students who own a computer at home also reported a lower level of computer anxiety compared to those who do not. On the other hand, Gemmil and Peterson (33) observed that there is a positive correlation (r = 0.306) between stress perception and internet usage.

5. CONCLUSIONS

The results of this study on perceived stress level and computer technology attitude of students studying in health sciences field at physiotherapy and rehabilitation, nutrition and dietetics, nursing, and health institutions management departments prove that university level computer technology attitude in Turkey has risen. Besides, it is found out that "developing communication and obtaining new information" is a priority for using computer technology. On the other hand, it is also noticed that female students whose mothers' are university graduates and who have computers have more positive attitudes towards computer technologies. Moreover, it is concluded that with positive computer technology attitude perceived stress levels decrease.

When the current increase in stress factors on an individual is taken into consideration, it can be concluded that correct and proper use of computer technologies can be accepted as a component of overcoming stress methods.

CONFLICT OF INTEREST: NONE DECLARED.

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