

## The Role of Contextual Factors in Cyberspace Harm, Anxiety, Aggression, and Students' Academic Performance

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### ABSTRACT

**Background:** Nowadays, cyberspace has presented both concerns and interests for the educational researchers. This study aimed to investigate the role of contextual factors in cyberspace harm, anxiety, aggression, and academic performance.

**Methods:** A descriptive correlation research method was applied. The research population covered all high school students in Yazd (21,328 students). The number of 377 students were chosen as the sample through a stratified sampling based on the Cochran's formula. The research tools included the questionnaires of contextual factors, and the standard scales of cyberspace harm, anxiety, aggression, and academic performance. The validity and reliability of the scales were determined. Data were analyzed by variance, t-test, and Tukey post hoc test.

**Results:** The findings showed that there are significant differences in cyberspace harm according to some contextual variables such as gender, educational and academic levels, educational district, type of school, field of study, and parents' occupation. More precisely, the harm of cyberspace was more high among the schools of District 2, non-public schools, and the academic field of humanities. Moreover, there was no relationship between the parents' education and the other variables. However, there was a significant relationship between the parents' occupation, regarding the employed mothers, as well as anxiety.

**Conclusion:** In general, it can be concluded that cyberspace could provide students some challenges as it is affected by various contextual factors. According to the findings, several practical suggestions were presented in the study.

**Keywords:** Cyberspace, Anxiety, Aggression, Academic Performance, Underlying Factors, Secondary Education

## Introduction

Today, applying "cyberspace" capabilities has become more comprehensive and extensive among different societies, particularly the adolescent generation, so that its effects can be observed in different aspects of adolescents' lives. "Cyberspace" relates to a space that enables social interactions among diverse cultures through new technologies without considering the dimension of time and place (Morad Haseli & Manteghi, 2017).

On the other hand, "anxiety" is the most prevalent mental disorder in all age groups and is regarded as a significant factor in the appearance of some social and family problems (Somers et al., 2006). While children and adolescents experience an extended range of anxieties through their development, these anxieties are sometimes so severe that they make their everyday and educational life difficult (Abolghasemi & Saeedi, 2012). "Aggression" is also considered as one of the adolescents' behavioral characteristics which may show itself in various forms. Hostility reveals the cognitive aspect of aggression, and anger shows its emotional aspect. The behavioral aspect of aggression also takes place in "verbal and physical" forms (Khazaie et al., 2011). However, the effects of applying cyberspace, as well as the mentioned variables, can also affect an individual's "academic performance". Atkinson recognizes academic performance as an individual's learned or acquired ability in school subjects measured by standardized tests (Younesi & Salehi, 2016).

According to the research, the outstanding point is that being a cyberspace user can influence characteristics such as anxiety, aggression, and academic performance in students. While excessive use of cyberspace raises psychological arousal and restricts physical activity, it can result in physical and mental health problems, including depression, loneliness, and anxiety. Furthermore, inappropriately using cyberspace can interrupt the process of academic works, social life, and other aspects of a person's life, such as adolescent interactions with family (Nainian et al., 2016).

One problem is that communication technologies, particularly cyberspace capabilities, are increasingly getting introduced at homes, and more importantly, the absence of adequate awareness on the part of families can set students at risk more than anything else. One of the hazards of extreme use of cyberspace in students is its adverse effect on their mental health and academic performance causing students to drop out of the educational system. Accordingly, this alarming issue should be considered more than ever in education programs. The question that arises is that what is the role of contextual factors (such as family, school, academic major, etc) in using cyberspace in students, and in the meantime, what is the relationship between these contextual factors and anxiety, aggression, and students' academic performance? These issues have been less discussed among the research conducted in Iran, and this study plans to investigate the answer among high school students in Yazd.

There are some studies conducted outside Iran. For example, Shek et al. (2019) showed that parent's control behavior and maternal psychological control are two simultaneous and long-term predictors of adolescent Internet addiction variables. Kayastha et al. (2018) discovered that Nepalese adolescents are regularly normal Internet users. However, there is a significant relationship between some contextual factors such as age, educational background, and father's occupation, and adolescent Internet addiction and its range. Furthermore, Kilic et al. (2016) stated in their study that male students and single-sex vocational school students described higher levels of Internet addiction. It was recognized that Internet addiction scores are increased by getting students' poor academic performance. On the other hand, this score is decreased in students by increasing the level of family social support and communication skills in students. Luis et al. (2016) also showed that students who repeatedly play video games and engage in unhealthy behaviors have weaker



academic performance, while students who only play video games have better academic performance. Furthermore, Boo's research (2014) determined that there is a negative correlation between time spent on playing video games and academic performance, as well as between playing time and motivation.

Some studies conducted in Iran. For example, Misaghi et al. (2018) revealed that there is a significant relationship between parental performance and a wide generation gap between children and parents, and adolescents' addiction to social networks. Seraji et al. (2017) also determined that students use virtual social networks to gain new information, entertainment, and interact with others. Additionally, Shoja Kazemi and Shahabi Nejad (2016) stated that there is a significant relationship between playing computer games and students' aggression, as well as between the duration of playing computer games and the intensity of aggression. Kharazani (2016) also revealed that family's role in controlling the tendency to violence and students' membership in groups using the Internet and playing computer games leads them to violence. On the other hand, controlling their use of the Internet and computer games improves their managing violence in this group. Moreover, Hosseini Shirvani et al. (2015) revealed a strong relationship between computer games and academic failure and academic motivation. They discovered a weak relationship between computer games and student learning. Turi et al. (2015) showed that the average Internet addiction, anxiety, and depression in the Internet-addicted students were significantly more crucial than normal users. Also, Zandvanian et al. (2013) showed that extreme use of cyberspace affects the student in the family, education, adjustment, belief-worship, and psychological dimensions. It was further revealed that "cell phones" have the most, whereas "computer games" have the least harm for students among cyberspace devices.

## Methods

### A) Method and participants

This study was a quantitative one, and was conducted using the descriptive-correlational method. The statistical population included all high school students in two educational districts in Yazd (21,328 people), in academic year 2018. The number of 377 people were selected as the research sample through Cochran's formula recognizing the variance of the population.

### B) Research instruments

The research instruments included:

1- The "Contextual factors questionnaire": It included some demographic information about gender, parent's education, parent's occupation, type of school, educational district, educational level, and study field.

2- The "Cyberspace questionnaire" Zandvanian et al. (2013): This questionnaire has been developed to identify the rate of cyberspace injuries and chances in students. This test has five subscales and 30 items. The subscales include students' family, education, religious beliefs, and psychological factors. The method of scoring and interpreting the questionnaire were based on dual grading. The maximum effect was 5 and the minimum was 1. The Cronbach's alpha method was used to determine the reliability. The alpha value of the Internet item is 0.917, the computer game is 0.898, the TV is 0.916, the satellite is 0.933, and the cell phone is 0.90. The tool also has face validity since it was given to ten university professors to confirm the validity.

3- The "Aggression Test" (Zahedifar et al., 2000): A 94-item questionnaire was generated to create a preliminary form of aggression scale. It was presented to two psychologists to determine the face score. The scale was designed such that the subjects should respond to one of the four options: never (0), rarely (1), sometimes (2), and always (3). It was decided to measure the validity of the scale concurrently with three standard scales according to the Scree test (Cattle, 1996).

4- The "Anxiety Test" (Beck et al., 1988,

quoted by Fathi Ashtiani, 2009): The questionnaire includes 21 items and is scored in the range of 0 to 63. Its correlation coefficient (alpha coefficient) is 0.82, its validity differs from a one-week retest method to 0.75, and the correlation of its substances varies from 0.30 to 0.76. Five types of content, simultaneous, structural, diagnostic, and factor validity, have been measured for that test.

5- The "Academic Performance Test (APT)" (Adapted from Fam & Taylor Research, 1999, quoted in Dortaj, 2004): This test has 48 questions. The test is scored on a 5-point Likert scale. After calculating the components, questions related to the components of emotional effects and lack of outcome control should be reversed and then added to the scores of other components to calculate the total academic performance score. This test's content validity was evaluated by the professor's opinions and factor analysis method, and Cronbach's alpha method was used to evaluate the reliability of the test.

### **C) Data analysis method**

Data were analyzed using descriptive and inferential statistics in the form of t-test, F-test, Tukey test, and variance analysis method in SPSS 21 software. The t-test was used to compare data from different participants' groups and Tukey test was implied for pair comparisons between the groups. In addition, variance analysis was used for the means comparisons.

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## **Results**

### **1- The rate of cyberspace harm, aggression, and poor academic performance in high school students in districts 1 and 2**

The hypothesis of equality of the dependent variable variance was accepted for all variables employing the Levin test. In the mean comparison test, the significant value of cyberspace harm variables was less than 0.05, which confirms the difference of this variable between the students of districts one and two.

Cyberspace harm is more among students in District 2 than District 1. But in other variables, the district does not affect them.

### **2- The range of cyberspace harm, aggression, and poor academic performance in male and female students**

The significance value of cyberspace harm and anxiety variables has been less than 0.05, which confirms the difference between these two variables among male and female students.

Cyberspace harms males more than females, but anxiety is more in females than males. Other variables do not differ between male and female students.

### **3- The rate of cyberspace harm, aggression, and poor academic performance in first and second-grade students**

The hypothesis of equality of variance of the dependent variable was accepted for all variables using the Levin test. The significance value of all variables was more than 0.05. The mean comparison test shows that there is no significant difference between the variables among tenth and eleventh-grade students.

### **4- The range of cyberspace harm, aggression, and poor academic performance in public and non-public school students**

The significance value of cyberspace harm and aggression variables has been less than 0.05, which confirms the difference between these two variables among public and non-public school students.

Cyberspace harm and aggression are more among students in non-public schools than in public schools. Other variables do not differ between public and non-public school students.

### **5- The rate of cyberspace harm, aggression, and poor academic performance in students of humanities, experimental sciences, mathematics, physics, and vocational training**

All variables are significantly different in at least two different disciplines/field studies of students. We use Tukey's test to examine which fields have made a difference in these variables because of the homogeneity of variance. As the



results of the Tukey test show, students of humanities and experimental sciences are significantly different from each other in terms of cyberspace harm and this harm is more in humanities students. Next, there is a significant difference between students studying in the industrial field and students studying in mathematical physics and humanities in terms of aggression.

#### **6- The relationship between cyberspace harm, anxiety, aggression, and poor academic performance in students, and parents' education**

There is no significant difference between the level of father's education and any of the variables. Furthermore, according to the conducted test and the significant value of the test, we conclude that there is no significant relationship between the variables and the mother's education.

#### **7- The relationship between cyberspace harm, anxiety, aggression, and poor academic performance in students, and parents' occupation**

There is no relationship between the father's occupation and any of the variables. In the mean comparison test, only the significant value of the anxiety variable has been less than 0.05, which confirms the difference between students' anxiety and students whose mothers are employees or housewives.

As specified in the tables below, students whose mothers are employees are more anxious than students whose mothers are housewives. Other variables are not significantly different between employee and housewife mothers.

All the above results have been illustrated in the tables below (Tables 1- 8).

**Table 1. Demographic Characteristics of the Research Sample**

District	Gender		Total	School type		Total
	Girl	Boy		Public	Non-public	
District 1	90	94	184	9	1	10
District 2	104	89	193	9	2	11
Total	194	183	377	18	3	21

**Table 2. Results of One-way Variance Analysis**

Research variables		Sum of squares	Freedom degree	Mean of squares	F-Test statistics	Significant value
Cyberspace harm	Within-group	6.512	4	1.628	3.527	0.008
	Intergroup	169.390	367	0.462		
	Total	175.902	371			
Anxiety	Within-group	2.873	4	0.718	2.701	0.030
	Intergroup	97.313	366	0.266		
	Total	100.186	370			
Aggression	Within-group	3.828	4	0.957	3.956	0.004
	Intergroup	88.553	366	0.242		
	Total	92.382	370			
Academic performance	Within-group	4.551	4	1.138	6.566	0.000
	Intergroup	63.250	365	0.173		
	Total	67.802	369			
Research variables	Levin statistics	First freedom degree	Second freedom degree	Significant value		
Cyberspace harm	1.871	4	367	0.115		
Anxiety	0.371	4	366	0.829		
Aggression	2.203	4	366	0.068		
Academic Performance	2.823	4	365	0.052		



Table 3. Homogeneity Test of Variance

Research variables	Field of study	N	Subset for alpha = 0.05	
			1	2
Cyberspace	Experimental sciences	121	9374.1	
	Industrial school	34	8459.1	8459.1
	mathematical physics	30	0506.2	0506.2
	Technical and Vocational training	61	7847.2	7847.2
	Humanities	126		2.2054
	Significant		058.0	2.2054
Anxiety	Experimental sciences	121	1.6675	
	Industrial school	34	6713.1	6713.1
	mathematical physics	30	7225.1	7225.1
	Technical and Vocational training	65	8276.1	8276.1
	Humanities	125		8602.1
	Significant		313.0	112.0
Aggression	Experimental sciences	34	0.19848	
	Industrial school	30	2011.2	2011.2
	mathematical physics	121	2426.2	2426.2
	Technical and Vocational training	61		3376.2
	Humanities	125		3376.2
	Significant		59.0	0.615
Academic performance	Experimental sciences	120		1195.3
	Industrial school	314	7989.2	
	mathematical physics	61	9274.2	9274.2
	Technical and Vocational training	30	8044.2	
	Humanities	125	9714.2	9714.2
	Significant		0.213	0.128

Table 4. Results of Tukey Test for the Research Variables

Father's education	Research variables		Sum of squares	Freedom degree	Mean of squares	F-Test statistics	Significant value
	Cyberspace harm	within-group	3.563	5	0.713	1.526	0.181
		Intergroup	169.041	362	0.467		
		Total	172.604	367			
	Anxiety	within-group	0.354	5	0.071	0.257	0.936
		Intergroup	99.592	361	0.276		
		Total	99.946	366			
	Aggression	within-group	0.967	5	0.193	0.779	0.565
		Intergroup	89.564	361	0.248		
		Total	90.531	366			
	Academic performance	within-group	0.581	5	0.116	0.627	0.679
		Intergroup	66.789	360	0.186		
Total		67.371	365	0.713			



**Table 5. Results of One-way Variance Analysis (The Relationship Between Parents' Education and the Research Variables)**

Research Variables			Sum of squares	Freedom degree	Mean of squares	F-Test statistics	Significant value
Mother's education	Cyberspace harm	within-group	4.573	5	0.915	1.959	0.084
		Intergroup	170.396	365	0.467		
		Total	174.969	370			
	Anxiety	within-group	.687	5	0.137	0.503	0.774
		Intergroup	99.485	364	0.273		
		Total	100.171	369			
	Aggression	within-group	1.175	5	0.235	0.946	0.451
		Intergroup	90.411	364	0.248		
		Total	91.586	369			
	Academic performance	within-group	.096	5	0.019	0.102	0.992
		Intergroup	68.009	363	0.187		
		Total	68.104	368			

**Table 6. Levin Test & Comparison of the Means**

Research variables		Levin test for equality of variances		T-test to compare means						
		F-Test Statistics	Significant value	T-Test statistics	Freedom degree	Significant value	Mean difference	Error deviation for differences	95% Confidence interval Low limit	Up limit
Cyberspace harm	Assuming the equality of variances	0.753	0.386	0.531	368	0.595	0.04967	0.09348	-0.13414	0.23349
	Assuming the inequality of variances			0.520	93.262	0.604	0.04967	0.09551	-0.13997	0.23932
Anxiety	Assuming the equality of variances	1.494	0.222	1.987	367	0.048	0.14007	0.07049	0.00146	0.27867
	Assuming the inequality of variances			1.910	91.700	0.059	0.14007	0.07335	-0.00561	0.28575
Aggression	Assuming the equality of variances	3.466	0.063	0.346	367	0.729	0.02360	0.06813	-0.11039	0.15758
	Assuming the inequality of variances			0.313	86.833	0.755	0.02360	0.07537	-0.12622	0.17341
Academic performance	Assuming the equality of variances	1.476	0.225	0.373	366	0.710	0.02183	0.05860	-0.09341	0.13707
	Assuming the inequality of variances			0.388	99.862	0.699	0.02183	0.05629	-0.08985	0.13352

Table 7. Results of One-way Variance Analysis

Research variables		Sum of squares	Freedom degree	Mean of squares	F-Test statistics	Significant value
Cyberspace harm	Within-group	1.970	4	0.492	1.042	0.386
	Intergroup	172.082	364	0.473		
	Total	174.052	368			
Anxiety	Within-group	1.903	4	0.476	1.762	0.136
	Intergroup	98.022	363	0.270		
	Total	99.925	367			
Aggression	Within-group	0.245	4	0.061	0.243	0.914
	Intergroup	91.586	363	0.252		
	Total	91.830	367			
Academic performance	Within-group	1.200	4	0.300	1.628	0.167
	Intergroup	66.726	362	0.184		
	Total	67.926	366			

Table 8. Relationship Between Mother's Employment and Student Anxiety

Research variable	Mother's occupation	Mean	Standard deviation
Anxiety	Employee	1.8773	0.54567
	Housewife	1.7372	0.51295

## Discussion

The results of this study indicated that there are significant differences in the harmfulness of cyberspace in some contextual components such as gender, grade, and field of study, type of school, and parents' occupation. The first finding was that cyberspace's harm in schools in District Two of Yazd is more than District One. We can refer to the issue of socio-economic class differences to explain this finding, which appears to have proved itself in this result. Students in District 2 schools, which are moderately larger and richer, have used greater cyberspace capabilities and have been harmed more. Additionally, another finding showed that cyberspace harm is more in boys than girls, which is consistent with the findings of Azad Majd and Rasooli (2013), Dufour et al. (2016), and Desai & Sarin. (2010). The results of a study conducted by Dufour et al. (2016) in examining the role of gender to use cyberspace in Canadian high school adolescents determined that boys use cyberspace more than girls, and their use is frequently in the field of Internet computer games. However, girls are more active in social networks. A study conducted by Desai & Sarin. (2010) also

discovered that high school boys who use cyberspace and Internet games experience more stress than female users. We can refer to psychological issues and psychological differences between the two groups to explain this study's findings. Adolescents seem to spend more time in cyberspace. Presumably, the dominant and traditional thinking of families that prefer the boys to spend time on the Internet using their computers or cell phones instead of going out with groups of friends and have fun outside the home can be a factor. However, family monitoring can still be rejected in this type of cyberspace communication.

Another finding showed that there is more anxiety in girls than in boys. This finding is consistent with the findings of the study conducted by Turi et al. (2015) and is inconsistent with the results of the study of Desai & Sarin (2010). In explaining this finding, it can be noticed that in the Fodor classical view (1974), it is stated that anxiety behavior is consistent with the traditional definition of female roles. Bem (1981) Gender Role Theory declares that girls and boys become social to promote the behaviors, traits, skills, and interests determined in society that are consistent





with their genders. Because the expression of anxiety is inconsistent with the male gender role, fearful behavior in boys may be less authorized. Furthermore, the behavior of social factors (such as teachers, peers, and the media) may strengthen behaviors consistent with the gender by improving courage among boys and anxiety among girls (Ali Akbari Dehkordi et al., 2013).

Besides, another finding obtained from the present study indicated that cyberspace is more harmful to students in non-public schools. In this view, we can refer to the necessity to concentrate more on educational programs to inform administrators, parents, and students of this type of school about the harms of excessive use of cyberspace.

We observed another finding that revealed cyberspace is more harmful and creates more anxiety for humanities students. Ybarra et al. (2005) consistent with this study, determined that more young people reported more anxiety, they used more Internet in the same way. Thus, it can be explained that social networks can seriously affect the individual's physical and mental health, ranging from insomnia or sleeplessness to aggression and impulsivity, by engaging people with a comprehensive range of pleasant or unpleasant content that is exchanged in these networks.

We achieved another finding that explained there is no relationship between the parents' level of education as well as the father's occupation and any of the variables. This recent finding is consistent with the studies conducted by Turi et al. (2015) and inconsistent with the findings of the study conducted by Kayasta et al. (2018) on the influence of father's occupation on adolescent child Internet addiction. Besides, it was discovered that the significance value of the variable "anxiety" is less than 0.05, which confirms the difference between students' anxiety and students whose mothers are employees or housewives. Besides, the results pointed out that students whose mothers were employees were more anxious than students whose mothers were housewives. This finding is moderately consistent

with the results obtained from the study conducted by Shek et al. (2019) on the role of maternal psychological control over child Internet addiction. Both studies stress the significance of the mother's role in reducing anxiety as well as monitoring the child's application of cyberspace.

### Conclusion

It can be concluded that cyberspace could provide students some challenges as it is affected by various contextual factors. In short, this study gives the following suggestions based on the above findings:

- \* It seems necessary to study planning and apply expert counselors by schools and parents because cyberspace is more harmful among boys.

- \* It is recommended to hold more workshops, awareness sessions, and more specialized consultations for the administrators, parents, and students of these schools in the field of cyberspace opportunities and challenges due to the more comprehensive harmfulness of cyberspace among students of non-public schools and schools in District 2 of Yazd.

- \* The demand to educate and inform adolescents studying in the humanities field about the vulnerabilities of cyberspace and the need to make more fun the educational programs of this group of students are felt more than ever due to the higher harmfulness of cyberspace and more anxiety among humanities students.

- \* The requirement to decrease the absence of the mother's presence to create a more cohesive emotional relationship between mother and adolescent looks unavoidable given the significant relationship between student "anxiety" and the mother's employment. In this view, training and educational sessions of the Parents and Teachers Association and notifying parents, particularly mothers, can help to solve this problem.

### Conflict of interest

Authors declare no conflict of interest during the study period.

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### Authors' Contribution

Conceptualization: M.K.; Methodology: M.K.; Investigation: M.K. and Z.S.A.; Formal analysis: Z.S.A.; Data Curation: Z.S.A.; Writing original draft: M.K and Z.S.A.; Writing, review & editing: M.K.

All authors read and approved the final manuscript and are responsible for any question related to the article.

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