
Cyberbullying and its relationship with perceived stress in high school students – A Case of study in the Province of Tungurahua
El cyberbullying y su relación con el estrés percibido en estudiantes de bachillerato de la provincia de Tungurahua

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Abstract: This research analyses the cyberbullying phenomenon and its relationship with perceived stress of high school students. The study applies the Perceived Stress Scale called “The Cyberbullying Questionnaire” (CBQ) developed by Cohen and its complement the Cyberbullying- Victimization Questionnaire(CBQ-V) on a sample of 1002 high school students. It is found that this phenomenon is prevalent among such students since 45% of the subjects have reported being victims of bullying and 69% displayed perpetration behavior. Furthermore, it is found that perceived stress and cyberbullying in both cases victims and aggressors are related since the greater the level of cyberbullying involvement the more perceived stress there is.

Key words: Cyberbullying, perceived stress, students, victimization, aggressive behavior

Resumen: En la presente investigación se analiza el fenómeno del cyberbullying y su relación con el estrés percibido en estudiantes de primero, segundo y tercero de bachillerato. Para ello se aplica la escala de estrés percibido de Cohen, el “Cyberbullying Questionnaire” (CBQ) y su complemento el “Cuestionario de cyberbullying-victimización” (CBQ-V) en una muestra de 1002 estudiantes de bachillerato. Se encuentra que el fenómeno está arraigado en los estudiantes de bachillerato ya que el 45% de los sujetos reporta ser víctima de cyberbullying y el 69% reporta haber realizado conductas de perpetración. Además, se encuentra que el estrés percibido y el cyberbullying (en sus dos caras, tanto en víctima como en victimario) presentan relación, ya que a mayor nivel de participación en el fenómeno se reporta mayor nivel de estrés percibido.

Palabras clave: Cyberbullying, estrés percibido, estudiantes, victimización, comportamiento agresivo

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Introduction

The cyberbullying phenomenon is understudied across the world given its impact on mental and physical health of adolescents. There is considerable literature in different places but there have not been researches within the Ecuadorian context. The objective of this research is to analyse this phenomenon and its relationship with perceived stress in the Province of Tungurahua.

Cyberbullying is bullying among peers that takes place over digital devices to harass, bully and humiliate. (Garaigordobil, 2011). Prevalence figures among countries are different, and the ones found in Spanish - speaking countries are detailed below:

Aggressors, or those whose behaviour is considered to be cyberbullying were found among almost half of the participants in the Basque country. (Calvete, Orue, Estévez, Villardón, & Padilla, 2010), Valencia (Buelga, Iranzo, Cava, & Torralba, 2015). In the Latin American context similar figures were found especially in Mexico (Gámez, Villa, & Calvete, 2014) and slightly lower in Chile (Varela, Pérez, Schwaderer, Astudillo, & Lecannelier, 2014) and Lima (García et al., 2014).

When it comes to the victim, that is to say, the one who is cyberbullied, it has been shown around 30% of the participants are victims. (Durán & Martínez, 2015; Estevez, Villardón, Calvete, Padilla, & Orue, 2010; Garaigordobil & Aliri, 2013). In other words, literature shows cyberbullying to occur at a high prevalence.

The implications of such a phenomenon are gathered in a vast amount of literature. There are studies that analyse its impact on academic performance (Ortega & Gonzalez, 2015), but this is not the sole effect, since it has consequences on mental health. Victims suffer from depression, stress, low self-esteem, frustration, nervousness, irritability and sleep disorders, among others (Garaigordobil, 2011). A meta-analysis undertaken in the United States, shows that victims suffer from depression, anxiety and even with aggression and substance abuse (Fisher, Gardella, &

Teurbe, 2016). The victims show lower self-esteem and more depressive symptoms, maltreatment cognitions according to a study conducted in the Basque country (Calvete et al., 2010); in addition to showing more feelings of loneliness and anxiety (Heiman & Olenik, 2016) as reported in a study with students in Jerusalem. A study from Korea also found that victims suffer negative effects in self-esteem, depression, hope and life satisfaction (You, Lee, & Kim, 2016). As shown, this phenomenon has been studied extensively and the results are quite similar in different parts of the world.

This study aims to discuss this phenomenon since no scientific studies about cyberbullying have been found in Ecuador. It will focus on exploration and description of the phenomenon in a city of the Province of Tungurahua. Furthermore, a relationship between cyberbullying and perceived stress will be analysed.

Different theories about stress are grouped into three groups. There are theories based on physiological responses focussed on physiological changes caused as a response to stressful situations, which involved the General Adaptation Syndrome (Selye, 1963).

Another group of theories focus on stimuli that create stress such as the taxonomies developed by Weitz, in which several situations that cause stress are listed (Weitz, 1970). A third group of theories are transactional or interactional, which states that stressful situations are better understood as an interaction between the subjects and the environment (González, García & Landero, 2011).

The perceived stress construct is related to the transactional model of stress, which is caused when an individual appraises a particular situation as a threat (Lazarus & Folkman, 1984), and typically measured by the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) since it is widely known for its psychometric properties. (Andreou et al., 2011; Campo, Bustos, & Romero, 2009; Campo, Oviedo, & Herazo, 2015; Lee, Chung, Suh, & Jung, 2015; Leung, Lam, & Chan, 2010; Pedrero et al., 2015; Pedrero Pérez et al.,

2015; Vanegas, González, & Cantú, 2016; Veliz, 2012).

When the subject is a victim of cyberbullying, the subject can face a stressful situation. Therefore a relationship between victimisation and perceived stress would be expected.

This assumes that this phenomenon exists in the province, and the prevalence figures shall be similar to other countries studies. Moreover, there is a second hypothesis related to perceived stress, which would lead us to expect higher levels of stress in terms of victimisation levels and perpetration.

Instruments and Methods

Non-experimental design based on cross-sectional with exploratory, descriptive-correlational scope. The main variables of the study are Victimisation, Perpetration and perceived Stress. Furthermore, sociodemographic variables such as gender, type of school and age.

Participants

There were 49,194 young adults aged 15 to 19 and an attendance rate of 80% within the educational system in 2015 (INEC, 2015) in Tungurahua according to the National Institute for Statistics and Census. Therefore, the population of interest is 39,808, at a 95% confidence level and 5 percent margin of error, since the sample was made up at least 381 cases. The study sample comprises 1002 adolescents aged 15 to 20 with an average of 15.92 and SD= 1.22, having 52.8% females in the sample. A stratified random sample was conducted, taking into account the type of school (public and private), the inclusion criteria being whether the adolescent was attending any high school level.

Measure

The research utilised two instruments to measure cyberbullying. The first one was for both victims and aggressors while the second instrument was used to measure perceived

stress. Both instruments shows good construct validity and reliability on students from Tungurahua. (Larzabal, Ramos, & Moreta, n.d.).

The Cyberbullying Questionnaire" (CBQ) developed by (Calvete et al., 2010) was used, which comprises 16 of the Likert items on three levels that measure how cyberbullying is inflicted, having a Cronbach alpha of $\alpha = .885$.

The Cyberbullying- Victimisation Questionnaire (CBQ-V) developed as a complement of CBQ (Estevez et al., 2010) was applied to measure the victimisation rate. It comprises 11 of the Likert items on three levels, having a Cronbach alpha of $\alpha = .896$. As such, the instrument is reliable (Cronbach, 1951).

Perceived stress was measured by applying the Perceived Stress Scale (PSS) by Cohen and (Cohen, Kamarck, & Mermelstein, 1983), using the Spanish plain version (Remor, 2006), obtaining a Cronbach alpha of $\alpha = .811$. The PSS has positive psychometric properties on students samples (Larzabal & Ramos, 2019), hence, it is reliable and valid.

Procedures

The instruments were conducted during September 2015 and March 2016 with the prior authorization of the schools. A pilot test was performed with 30 students from the first year to ensure they understood the questions. Since first year students understood the instruments, it is assumed that second and third years understood.

Data Analysis

The SPSS 20 Statistical Package was used for data analysis. An exploratory analysis of the variables was conducted to monitor its behaviour. At first, a cyberbullying analysis was performed, including its prevalence and gravity levels to then, establish gender difference, type of school and high school level. Next, the perceived stress scale was carried out. Finally, a One-Factor ANOVA was applied to analyse if there were significant differences in the perceived stress in the

different levels of victimisation and perpetration.

Results

The study considers low level victims (VL) for students who withstood 1 to 3 bullying behaviours; moderate level victims (VM) 4 to 8 bullying behaviours, and severe level victims (VG) 9 or more bullying behaviours. Furthermore, aggressors are divided into minor level aggressors (AL) 1 to 3 bullying behaviours, moderate level aggressors (AM) 4 to 8 bullying behaviours and severe level aggressors (AG) 9 or more bullying behaviours. (Table 1).

Table 1
Levels of victimisation and perpetration (Gender)

	Males	Females
Non Victim	46.9%	59.5%
Low level Victim	44.8%	37.4%
Moderate Victim	3.8%	2.1%
Severe level Victim	1.5%	0.9%
Non Aggressor	24.3%	37.1%
Low level Aggressor	50.5%	52.6%
Moderate Aggressor	19.7%	8.7%
Severe level Aggressor	5.5%	1.7%

It should be noted that some respondents are not involved in the problem, that is to say they are neither aggressors nor victims. Many of those who are victims are also aggressors; there were not moderate nor severe victims that were not aggressors (Table 2).

Table 2
Contingence table between perpetration and victimisation levels

	Non Aggressor	Low-level Aggressor	Moderate Aggressor	Severe Aggressor	Total
Non Victim	278	251	20	2	551
Low-level Victim	33	259	98	20	410
Moderate Victim	0	7	17	5	29
Severe Victim	0	0	4	8	12
Total	311	517	139	35	1002

After having verified normality, homoscedasticity and serial independence, a Student t-test was applied to compare the scores obtained in perpetration and victimisations, taking gender into consideration and having the following results: $t=3.063$ $p<.001$ for victimisation and $t=7.194$ $p<.001$ for perpetration. Namely, there are significant statistical differences for both variables, with male students having the highest scores in perpetrations and victimisation.

One-way analysis of variance (ANOVA) was conducted (once the assumptions are met) to analyse if the high school level (first, second and third year) was correlated with victimisation and perpetration. The analysis shows there were no statistically significant differences between victimisation and high school level ($F=.035$ $p>.05$). Conversely, there were statistically significant differences between perpetration and high school level ($F=3,337$ $p>.05$). The Post-hoc Tukey test shows that perpetration is matched by the level of high school, namely, the higher the school year the more perpetrations there are in terms of cyberbullying.

The data presented in Table 3 shows perceived stress.

Table 3
Perceived Stress

	N	Min	Max	Mean	SD
<i>Perceived Stress (males)</i>	473	7	47	25.01	6.055
<i>Perceived Stress (females)</i>	529	2	59	25.746	6.522

Having met all the assumptions, a Student t-test was conducted to determine if there were statistically significant differences with the following result: $t=-1.845$ $p>.05$. Consequently, the null hypothesis is assumed, in other words, there are no statistically significant differences between perceived stress and gender.

Furthermore, there are no statistically significant differences between perceived stress and the type of school ($t=.682$ $p>.05$) after the perceived stress analysis. At the end,

a one-way ANOVA was conducted to correlate the level of high school and perceived stress, which showed there were no differences ($F=1.938 p>.05$).

After analysing the core variables of this research (Perceived stress, victimization and perpetration) with each of the sociodemographic variables, an analysis of variance was carried out to confirm or reject the null hypothesis of the investigation, namely the relationship between perceived stress, victimization and perpetration.

A one factor ANOVA was conducted and showed there were statistically significant differences in the scores of perceived stress and the level of victimisation suffered ($F=10.212 p<.01$). The Post-hoc tests showed the subsets were different, as the level of perceived stress grows based on the level of victimisation (non-victim, low-level victim, mild- level victim, severe -level victim).

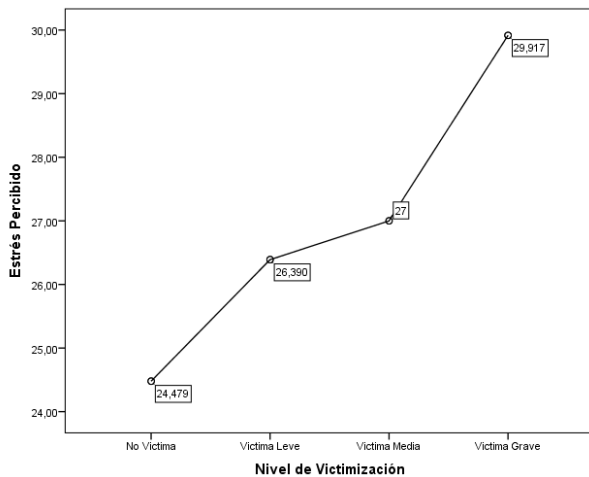


Figure 1
Variance analysis

The one-way variance analysis was conducted to test if the perpetration level and the perceived stress level were correlated, having $F=12.06 p<.01$; hence there are differences. Tukey shows there are two homogeneous subsets with a positive relationship between cyberbullying behaviours and perceived stress. For instance, as shown in Chart 2, the level of perceived stress differs from non-aggressors, low, moderate and severe level aggressors, thus, the more the

perpetrations are being made the more perceived stress they have.

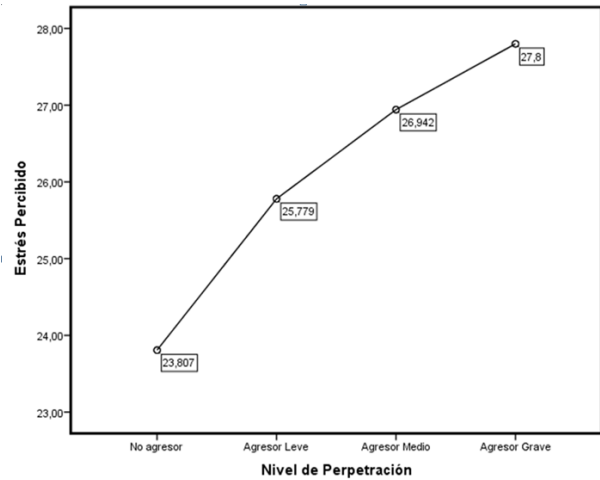


Figure 2
Variance analysis

Conclusion and Discussion

Cyberbullying is deeply rooted in Tungurahua, having a similar prevalence to that found on research in Europe, thus, fulfilling the first hypothesis. The analysis also shows that cyberbullying is more common in males than females in both perpetration and victimisation and more importantly in private schools rather than public ones. The reason behind such findings are unknown, the hypothesis being that this occurs due to technology access in private schools since cyberbullying requires access to technology.

Given that public schools lack technology (generally due to lower budgets) and hence, do not have easy access to technology. It would certainly be of interest for future researches to analyse if this is the cause of cyberbullying.

Interestingly, there is an overlap i.e. the same subject can be both a cyberbullying aggressor and a victim at the same time. This prompts, two hypotheses for future investigations: the first when aggressors are victims (Tit for tat) and the second when victims bully other victims i.e. a 'knock-on' effect.

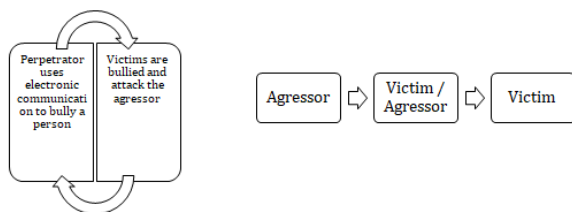


Figure 3
Hypothesis “Tit for tat” vs “knock-on”

To sum up, the analysis shows that no gender variables, type of school (public or private) and the level of high school are correlated with perceived stress. In turn, based on the second hypothesis, there is a correlation between perceived stress and the level of perpetration (victimisation). In other words, there is a higher level of perceived stress reported the more cyberbullying behaviour that occurs.

In conclusion, cyberbullying exists among high school students and it is entirely related to perceived stress given that, the more victimisation behaviours and perpetration there are, the more perceived stress is found among students.

Authors' participation:

a) Conception and design of the work; b) Data acquisition; c) Analysis and interpretation of data; d) Writing of the manuscript; e) Critical review of the manuscript.

A.L.F., has contributed in a,b,c,d,e; M.I.R.N., in a,b,d,e; A.E.H.H., in d,e.

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