Proceeding

Social use of internet in adolescents: Relationship with cyberbullying and levels of physical activity

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ABSTRACT

An unsuitable and abusive use of the Internet and the technologies that support it (e.g. mobile phones and computers) can be related to the appearance of different problems and risks during adolescence, such as addiction and cyberbullying (CB) (Armstrong et al., Saling, 2000; Carbonell et al., 2012; Tokunaga, 2010; Tsitsika et al., 2015). The objective of this research is to know about the use of social networks (SN) and communication applications, the degree of intrapersonal (IntraA) and interpersonal (InterA) addictions caused by the problematic Internet use, as well as the possible relations between dependence, CB and physical activity (PA) levels determined, in an objective manner, through the use of accelerometers. Results show that there is an IntraA of M = 2.21 (SD = 0.62) and an InterA of M = 1.97 (SD = 0.53), as it is the need of continuously checking the SN and WhatsApp (WAPP), the use of the Internet as a way of escaping from problems and the withdrawal from other activities in order to being connected to the Internet for a longer period of time. There is a relation between the Internet addiction and CB but not between the different levels of PA performance and these variables. **Key words**: INTERPERSONAL RELATIONSHIP, INTRAPERSONAL RELATIONSHIP, ADDICTION, SOCIAL NETWORKING, SPORT, MOBILE PHONE.

INTRODUCTION

The use of the Internet and social networks (SN) has increased in the last years among young people. According to the data of the National Statistics Institute (Instituto Nacional de Estadística. INE, 2017), 95.1% of the young people between 10-15 years old are Internet users, which is facilitated by the wide accessibility to different electronic devices (e.g. tablets, computers and mobile phones) at these ages. From increasingly earlier ages children have their own smart phones with percentages that raise from 25% in 10-year-old children, 75% in 12-year-old, up to 94% at the age of 15.

The Internet, in addition to having an educational use, is mainly a leisure and communication tool for 82.3% of the children, according to the data provided by the Childhood Observatory in Andalusia (Observatorio de la Infancia, 2010).

However, the unsuitable and abusive use of the Internet and technologies that support it (e.g. mobile phones and computers) can be related to the appearance of different problems and risks at all ages and especially among the youngest. According to results in many studies, adolescence is a period very susceptible to the appearance of problems associated with the Internet (Armstrong et al., Saling, 2000; Carbonell et al., 2012; Estévez et al., 2009; Gómez et al., 2014; Pichel, 2014; Tokunaga, 2010; Tsitsika et al., 2015).

Those online activities more often related to a problematic Internet use among teenagers are chats, WhatsApp (WAPP), SN, emails and online games (Carbonell et al., 2012; Giménez et al., 2017; Muñoz-Rivas et al., 2010). Data from the EU Kids Online European study (quoted in Garmendia et al., 2011) show that 97% of young people have a profile in a SN.

This tool is very appealing to teenagers since it allows them to create communication nets with many people and keep contacts for long periods of time at any moment. At the same time, at these ages the fact of having a larger amount of online contacts provides them with a feeling of comfort (Kim and Lee, 2011). Nonetheless, it can become a problem according to the studies by Casas et al. (2013), Garmendia et al. (2011) and Tsai and Lin (2003).

Problems linked to the Internet use can be translated into the appearance of addictions (Carbonell et al., 2012; Echeburúa and Corral, 2010; Helguera, 2017; Labrador and Villadongos, 2010; Sánchez-Martínez and Otero, 2009; Ybarra and Mitchell, 2004), a higher risk of cyberbullying (CB) (Antoniadou et al., 2016; Dinev et al., 2008; Fernández and López-Hernáez, 2015; Fernández-Montalvo et al., 2015; Giménez et al., 2017; Kowalski et al., 2014; Ortega et al., 2013) and other ways of aggressive behaviour like cybergrooming and sexting. (Ortega et al., 2013).

Bernanuy et al. (2009) present as problems related to the Internet use the appearance of Intrapersonal (IntraA) and Interpersonal (InterA) conflicts that ultimately reveal symptoms similar to those of other addictions such as, the loss of control over its use, the need to increase the time of exposure to reach satisfaction, the withdrawal from other leisure activities like meeting friends or the performance of physical activity (PA), the appearance of conflicts with parents, hiding, a decrease in the academic performance, changes of behaviour associated with being deprived of access to their mobile devices and/or the Internet, irritability and insomnia (Aragón et al., 2016; Arora et al., 2014; Fernández-Montalvo et al., 2015; Muñoz-Rivas et al., 2010).

The highest risk of suffering CB in children and teenagers is related to behaviours on the Internet that increase their vulnerability due to overexposure, as those described by Bringué and Sádaba (2011), Fernández-Montalvo et al. (2015), Garaigordobil (2013), Helguera (2017) or Hinduja and Patchin (2009), for instance: making contact with people they do not know; arranging appointments with strangers; sharing personal information, photos, videos or passwords; lying about their age or physical appearance; sending or receiving offensive or insulting messages; and defaming or spreading rumours in order to cause harm.

There are few studies that have analysed the relationship between the physical-sport activity and the Internet use, which can be utilised to confirm whether, as stated by authors like Fernández-Montalvo et al. (2015) and Ortega-Ruiz et al. (2012), the unsuitable and abusive use of the Internet and electronic devices reduces and distances people from their leisure activities.

There is a confirmed relation between the abusive and unsuitable use of the Internet and a higher risk of addiction and CB, but is there any relationship between these elements and the PA performed by teenagers?

The research by Kim at al. (2015) shows that young men with a problematic Internet use through mobile phones perform less PA than those with a more standard use. In young women, this type of unsuitable Internet use is related to a higher probability to being less active physically (Piguet et al., 2015). Besides, there is a higher use of the technologies and shorter time to perform PA in those teenagers with a higher tendency to boredom (Biolcati et al., 2018).

Conversely, studies which analyse the PA and its relationship to bullying (B) and CB do not show conclusive data. In this sense, Chacón-Cuberos et al. (2015) and Zurita et al. (2018) do not find significant relationships between extracurricular sport practice, sport category and B. Only the study by Ortega et al. (2008) finds connections between a higher self-esteem of the sport factor in attacking children with respect to the victims of B and CB.

This present research aims at: (i) analysing the Internet use as a communication tool and creation of SN in teenagers; (ii) knowing the degree of IntraA and InterA generated by the problematic use of the Internet; and (iii) defining the possible relationships between dependence, CB and the levels of PA determined in an objective way through the use of accelerometers.

METHODS

Design and Participants
The present research is framed within the context of a non-experimental, descriptive and correlational cross-sectional study.

Incidental sampling in secondary schools with 184 students. A specific sample of the study of 54 students (M = 14.26; SD = 1.34), to whom accelerometers are set to measure the PA levels.

Instruments
Adjustment of the *Internet-Related Experiences Questionnaire* (IREQ) (Casas et al., 2013) with $\alpha = 0.79$, whereas in the present research $\alpha = 0.81$. It consists of 12 items, Likert type scale, with marks ranging between 1-4 (where 1 means "nothing" and 4 means "quite") that reflect a frequency degree between "nothing" and "quite". The questionnaire measures two dimensions: (i) Intrapersonal conflict or dependence (IntraA). In this present research $\alpha = 0.71$, which includes variables such as "do you get angry or irritable

when you get distracted while you are using WAPP or connected to any SN?", "how often do you stop doing the things you are doing in order to stay connected to a SN or WAPP for a longer period of time?"; and (ii) Interpersonal conflict or dependence (InterA). In the present research α = 0.69, which includes elements such as "do you think life without SN or WAPP is boring, empty and sad?", "how often do you add new contacts of people you have met through the Internet or SN?" or "when anything happens to you, do you need to either upload it to your profile or write some commentaries in WAPP?"

The Spanish version of the *European Cyberbullying Intervention Project Questionnaire* (ECIPQ) (Del Rey et al., 2015) comprises 22 items, Likert type scale, with 5 options, with marks ranging between 0-4 (where 0 means "never" and 4 means "always"). It includes actions to describe behaviours performed or suffered such as bad words, threats, rumours exclusion or spreading, or identity theft, among others. They happen by means of an electronic device referred to a period within the last 12 months. Own validation (α = 0.69).

ActiGraph GT3X accelerometers physical activity. Objective method of time slots determination that each subject devotes to the PA performance of low, moderate or high intensity.

Procedure
Previous to the execution of the research, the informed consent of the family and the authorisation of education centres are requested.

The questionnaires are conducted at the school centres in the presence of the questioner. Once they have been finished, the ActiGraph GT3X accelerometers are set. They are programmed and initialised in a synchronised way through the Actilife 6.0 program to be worn at the waist, above the iliac crest, for seven days (60-second epoch).

Data analysis
The descriptive analysis of the variables "use of communication applications" and "IntraA" and "InterA" is presented with frequencies, percentages, means, typical variances and modes.

Bivariate correlations are also applied delivering the Spearman correlation coefficient to test the level and the relationship direction among the different variables of the survey. The correlation level is established following the recommendations of the experts (Pulver et al., 1988).

In order to determine the levels of PA performance (i.e. low, moderate or high) used were, the cut points established by Eklund et al. (2004). The descriptive results of these variables are presented in the study by Corral-Pernía et al. (2018), belonging to the same work project. In the present work, they have been used in the correctional analysis together with the variables IntraA and InterA as well as Cyberagression (CyberA) and Cybervictimisation (CyberV).

We process the data by means of SPSS® version 24.0 (IBM Corp, Armonk, NY, USA) for Windows.

RESULTS

96.3% of the survey respondents use Internet applications as a way of communication in SN. Most of the young people often use two applications (57.4%), followed by 29.6% who use only one and 93% who use three or more applications. Among the most utilised, the first option is WAPP (66.7%), followed by Instagram and Snapchat (Table 1.)

Table 1. Communication applications and SN used as 1st and 2nd option

	1st option		2nd option	
	Frequencies	%	Frequencies	%
WhatsApp	36	66.7	10	18.5
Instagram	15	27.8	21	38.9
Snaptchat	1	1.9	2	3.7
Telegram	0	0	1	1.9
Twiter	0	0	1	1.9
Skyppe	0	0	1	1.9
None	2	3.7	18	33.3
Total	54	100	54	100

The global Internet addiction is M = 2.09 (SD = 0.53). There exists an IntraA of M = 2.21 (SD = 0.62) and an InterA of M = 1.97 (SD= 0.53).

Table 2. Intrapersonal and Interpersonal conflicts generated by the Internet use

IntraA	Mean	Mode	InterA	Mean	Mode
When you have problems, connecting to the SN or WAPP helps you escape from them	2.61	2	Life without the SN and WAPP is boring, empty and sad	1.91	1
You continuously check your SN and WAPP	3.28	4	When you are connected to a SN or use WAPP, you lose track of time	2.91	3
You get angry or irritable when you get distracted while you are using WAPP or connected to a SN	1.87	1	It is easier or more comfortable for you to relate to people through a SN or WAPP than face to face	1.57	1
Frequency of withdrawal of the things you are doing to spend a longer period of time connected to a SN or WAPP	2.0	2	Frequency with which you add new contacts of people you have met through the Internet or SN	2.31	2
When you are not online or you do not have your mobile phone to check your WAPP or SN, you feel unsettled or worried	1.65	1	Your academic performance has been negatively affected by the use of WAPP or the SN	1.63	1
You get nervous and check your mobile phone very often when it has been a long time from the moment you uplod a photo or write a commentary until your friends make some remarks	1.87	1	When anything happens to you, you need to either upload it to your profile or write commentaries in WAPP	1.54	1

Note: scale 1-4 (1 means "nothing" and 4 "quite")

As it can be observed in Table 2, the use of SN or communication applications such as WAPP generates an IntraA that is translated into the need of continuously checking the SN and WAPP (*M* =3.28; *SD* = 0.96), the use of the Internet as a way of escaping from problems (*M* = 2.61; *SD* = 0.99) and the withdrawal from other activities in order to be longer connected to the Internet (*M* = 2.0; *SD* = 0.91).

The InterA produces alterations in behaviours such as the loss of track of time when the teenager is connected to the Internet or uses WAPP (*M* = 2.91; *SD* = 0.89) as well as the fact of adding people met through the Internet or SN as new contacts (M = 2.31; SD = 1.02).

As an orientation (Table 3), and since there is no agreement on the assessment at which a behaviour is considered to be addictive, in IntraA 16.7% of the sample shows means within the range of the maximum values ("3"- "4"), whereas 50.1% shows mean within intermediate values ("2" up to "3"). In InterA, the means among the highest values are reached by 5.7% and the intermediate values by 48.3%.

Table 3 Assessments distribution of intrapersonal and interpersonal addictions for the scores 1-2, 2-3, 3-4

IntraA			InterA		
		% scores			% scores
Mean	%	(1-2, 2-3, 3-4)	Mean	%	(1-2, 2-3, 3-4)
1.17	7.4	33.4	1.17	3.7	46.3
1.50	13.0		1.33	11.1	
1.67	5.6		1.50	14.8	
1.83	7.4		1.67	5.6	
2.00	14.8	50.1	1.83	11.1	
2.17	5.6		2.00	18.5	48.3
2.33	7.4		2.17	9.3	
2.50	7.4		2.33	5.6	
2.67	9.3		2.50	5.6	
2.83	5.6		2.67	9.3	
3.00	7.4	16.7	3.00	1.9	5.7
3.17	7.4		3.17	1.9	
3.67	1.9		3.67	1.9	
Total	100			100	

A high percentage of the sample shows a potentially risk behaviour when using the Internet; for example, addiction issues or the appearance of other problems such as CB, cybergrooming or sexting, as it is described below in Table 4.

Considering the data about the high frequency of use (values "3" and "4"), the need of continuously checking the SN and WAPP is manifested by 75.9% of the simple, 70.4% losses the track of time when being online, 31.5% frequently adds as new contacts people they meet through the Internet or the SN (in this variable, only 20.4% states never adding as new contacts unknown people -value "1"-) and 22% stops doing other activities in order to be online for a longer period of time.

Table 4. Behaviours which describe the Internet use by teenagers

	You continuously check your SN and WAPP	Frequency of withdrawal of the things you are doing to spend a longer period of time connected to a SN or WAPP	When you are connected to a SN or use WAPP, you lose track of time	Frequency with which you add new contacts of people you have met through the Internet or SN
(Nothing) 1	5.6	31.5	7.4	20.4
2	18.5	46.3	22.2	48.1
3	18.5	13.0	42.6	11.1
(Quite) 4	57.4	9.2	27.8	20.4
Total	100%	100%	100%	100%

Note: Values displayed in percentages

The correlational analysis shows a significant positive relation between IntraA and cybervictimisation (CyberV) ($r = 0.305$; $p = 0.025$), between IntraA and cyberaggression (CyberA) ($r = 0.300$; $p = 0.027$), and between InterA and CyberA ($r = 0.328$; $p = 0.015$).

However, no correlation can be found between IntraA or InterA and the different levels of PA. Similarly, no correlation can be found between CB and the levels of PA, either.

Table 5. Relation between IntraA, InterA, CyberV, CyberA and levels of PA.

	1	2	3	4	5	6	7
1.IntraA	1.000	0.711[**]	0.305[*]	0.300[*]	-0.193	-0.166	-0.169
2.InterA	0.711[**]	1.000	0.234	0.328[*]	-0.080	0.009	-0.138
3.CyberV	0.305[*]	0.234	1.000	0.483[**]	-0.159	0.013	-0.092
4.CyberA.	0.300[*]	0.328[*]	0.483[**]	1.000	-0.070	0.141	0.072
5. PA Light	-0.193	-0.080	-0.159	-0.070	1.000	0.729[**]	0.332[*]
6. PA Moderate	-0.166	0.009	0.013	0.141	0.729[**]	1.000	0.519[**]
7. PA Vigorous	-0.169	-0.138	-0.092	0.072	0.332[*]	0.519[**]	1.000

Note: Spearman's coefficient **p < 0.01 *p < 0.05

DISCUSSION

Data obtained about the use of the Internet as a way of communication are very similar to those presented by the National Statistics Institute (INE, 2017) as well as by Sánchez and Otero (2010), close to 95%. Nevertheless, they are slightly higher than those collected by the Childhood Observatory in Andalusia (Observatorio de la Infancia, 2010).

In this present research, intrapersonal conflicts caused by the Internet use are higher than interpersonal ones ($M = 2.21$ and $M = 1.97$, respectively). Such data do not coincide with the ones obtained by Casas et al.

(2013) in which there are difficulties related to the use of the Internet reflected in interpersonal factors (IntraA = 1.77; InterA = 2.51) as well as in the study by Ortega-Ruiz et al. (2012) with (2.45 and 1.90).

The global Internet addiction of 2.09 is very similar to the one obtained by both research quoted above (Casas et al., 2013 and Ortega-Ruiz et al., 2012, with 2.14 and 2.18 respectively), considered as worrying or prospectively at risk.

If the percentage of the sample with a higher frequency of occurrence of problematic behaviours in SN and WAPP-type applications is considered, (values "3", "4") with 7.4% of the sample (16.7% in IntraA and 5.7% in InterA), this is in accordance with results obtained by Carbonell et al. (2012), with a percentage of 8.2%, lower to the ones obtained by Gómez et al. (2014) and Piguet et al. (2015), with 19.9% and 13% respectively, and on the contrary higher than 3.3% that is the percentage obtained by Estévez et al. (2015). It must be kept in mind that it is difficult to make valid comparisons among the different studies since there is no coincidence in order to establish the cut-off points from which this can be defined an abusive Internet use according to Beranuy et al. (2009).

One of the riskiest behaviours that can be associated with the Internet use is making contact with unknown people (31.5% frequently adds this kind of contacts). These are data very similar to those obtained by Helguera (2017) and Fernández-Montalvo et al. (2015).

Although in this present research neither the goal nor the effect of making contact with unknown people is analysed, it should be noted that Bringé and Sádaba (2011) state that 14% of teenagers have arranged an appointment through this mean and that most of the studies show that these aspects are some of the most commonly related to the risk of CB (Garaigordobil, 2013; Kowalski et al., 2014; Modecki et al., 2014).

The relations between the Internet addiction and CB have also been proved by Kowalski et al. (2014), Bear et al. (2011) and Fernández and López (2015) who note as risk factors the frequency of Internet exposure, the revelation of personal data and the social relationships in the net. However, no study can be found which identifies the possible relation between Internet addictions and behaviours related to CyberA, which have indeed been observed in this work with the InterA.

Finally, it should be pointed out that there exists very few studies which analyse the relationship between a problematic Internet use, CB and PA. In this present research no relation has been found among these variables, as opposed to Kim et al. (2015), where it is concluded that problematic users of mobile phones perform less PA, or Roman and Taylor (2013), who note a connection between victimisation and lower PA practice of at least for a period of 60 minutes a week. Nevertheless, there are indeed results which establish the fact of being more physically active by means of the involvement in sport activities as protective factor of victimisation and as decrease of the effects of B (Driessens, 2015; Merril and Hanson, 2016).

CONCLUSIONS

As the first objective is concerned, it must be highlighted that the use of SN and communication applications is very high, since it is obtained that practically the totality of teenagers use the Internet with this aim.

With respect to "the level of Internet addiction", 50% of the sample (M = 2.01) shows a potentially risk use towards the development of addictive behaviours or towards suffering or committing any kind of cyberabuse, in this case more related to intrapersonal conflicts than to interpersonal ones.

Concerning the third objective, "to know the possible relations among the variables dependence on the Internet, CB and PA levels", it can be concluded that there exists indeed a relation between dependence on the Internet and CB, between IntraA and CyberA and CyberV, and finally between InterA and CyberA. Nonetheless, there is no relation between dependence on the Internet and the levels of PA, or between CB and PA.

In light of the results and the few existing studies, it would be necessary to increase the number of studies that analyse the effects of the problematic Internet use and the PA, this last variable measured both in an objective manner and by means of specific questionnaires. It would also be suitable to assess the relation among the above variables with inactivity, sedentariness and sleeping hours.

Moreover, and due to the impact of teenagers' behaviour with respect to the Internet use, SN and communication applications, it would be appropriate to expand the measures that are already being developed in some school centres (aimed at children, young people, families and teachers) with the purpose of educating about an adequate use of these tools.

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