






Psychosocial factors and low-risk behaviour in ICT use among adolescents

Factores psicosociales y comportamiento de bajo riesgo de uso de TIC en adolescentes

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ABSTRACT

Many current investigations have analysed adolescents' risky ICT behaviours (such as excessive or addictive use), but few have explored the characteristics of low-risk behaviour in this regard. This study aimed to explore the psychosocial profile of a sample of 593 Spanish adolescents aged 13 to 18 who have been categorized as low-risk ICT users. To this end, the low-risk ICT use group was calculated using the "multitasking while doing homework index" and a set of items on risky ICT behaviour. Chi-squared and t-tests were performed and a forward stepwise binary logistic regression was carried out to determine the explanatory variables for low-risk ICT use. The results showed that some 7.1% were classified as low-risk ICT users, with a higher percentage of girls. These users' profile was characterised by: lower digital self-efficacy with social networking applications; less generalized ICT use and a less dependent attitude; less extroversion and more agreeableness and conscientiousness; higher academic self-concept; having rules for ICT use at home; and less insecure and anxious attachment to parental figures. The variables that predicted the likelihood of low-risk ICT behaviour were: high academic self-concept; low perceived separation anxiety from loved ones; and high agreeableness scores. These results are useful for proposing psycho-socio-educational interventions to promote healthy ICT use.

RESUMEN

Muchas investigaciones actuales analizan comportamientos de riesgo de adolescentes en el uso de TIC (como el uso excesivo o adictivo), siendo escasas las que exploran las características del comportamiento de bajo riesgo. El objetivo fue analizar el perfil psicosocial de una muestra de 593 adolescentes españoles de 13 a 18 años. El grupo de uso de TIC de bajo riesgo se calculó mediante: «el índice de multitarea mientras se realizan tareas escolares» e ítems sobre conductas de riesgo en el uso de TIC. Se realizaron pruebas Chi-cuadrado y pruebas t y una regresión logística binaria por pasos para predecir el bajo riesgo de uso de TIC. Los resultados mostraron que el 7,1% se clasificó como usuario de TIC de bajo riesgo, con mayor porcentaje de chicas. Su perfil se caracterizaba por: menor autoeficacia digital en redes sociales, menor uso generalizado de las TIC y una actitud menos dependiente; menor extroversión y mayor amabilidad y responsabilidad; un mayor autoconcepto académico; disponer de normas de uso de TIC en el hogar; y un apego menos inseguro y ansioso hacia las figuras paternas. Las variables que predijeron un comportamiento de bajo riesgo fueron: un elevado autoconcepto académico; una baja percepción de ansiedad por separación de los seres queridos; y una puntuación alta en amabilidad. Estos resultados son útiles para proponer intervenciones psico-socio-educativas que promuevan el uso saludable de las TIC.

KEYWORDS | PALABRAS CLAVE

ICTs, digital self-efficacy, digital attitude, personality, self-concept, family.
TIC, autoeficacia digital, actitud digital, personalidad, autoconcepto, familia.



1. Introduction and state of the art

Over the past decade, numerous investigations have attempted to identify the variables associated with risky behaviours on the Internet. One such example is the study of psychological and social variables that predict excessive use of ICTs (Information Communication Technologies) in adolescence due to the psychological impact this can cause (Helsper & Smahel, 2020; Kuss et al., 2020; Martín-Perpiñá et al., 2019a). Excessive ICT use occurs when the number of hours of use do not allow young people to lead a normal life (Malo-Cerrato et al., 2018; Vondrackova & Šmahel, 2019).

A recent meta-analysis on addictive Internet behaviour (also understood as problematic or excessive use) reveals how the scientific literature distinguishes between personality and environmental variables when predicting this behaviour in adolescents (Lozano-Blasco et al., 2022). At the level of individual personality variables, some of the risk factors would be introversion or low self-esteem, whereas agreeableness or conscientiousness would act as protective factors. In terms of environmental elements, adolescents' relationships with interpersonal contexts such as family and school stand out. It is thought that dysfunctional families and families with internal conflicts may be predisposed to excessive use, while good relationships with teachers and a good school climate could play a protective role. The same study highlights a disparity in the impact of the gender variable on this type of risky behaviour. Although a digital divide has been observed in girls in recent decades, these differences are currently considered to have been eradicated in European countries (Smahel et al., 2020), and while prior studies suggest that girls are more likely to make excessive use of social networks (Malo-Cerrato et al., 2018; Müller et al., 2017), a recent study of 19 European countries found that these differences were minimal or non-existent, with high frequencies of social network use being detected in both genders (Smahel et al., 2020). Although we understand the vital importance of determining which profiles are most associated with high-risk behaviours (such as excessive ICT use) in the digital environment, we focused our research question on the psychological and social profile of adolescents who present a low-risk behaviour with regard to ICT use. This alternative approach is not common in the recent literature and there have been few publications on this topic. One example would be Gudmundsdottir et al. (2020), who examined the responsible use of ICTs in two student teachers' samples in Spain and Norway.

In order to define the low-risk profile, we have used the following: a) a list of indicators of risky behaviours in the use of ICTs, such as having problems at school or having made excessive use of technologies (based on Livingstone et al., 2011), and a question regarding making new friends on the Internet. In respect of this, some studies have indicated that one of the online activities reported to be the highest risk among children and adolescents is related to the behaviour of communicating with new people they have never met face-to-face (Livingstone et al., 2011; Livingstone & Stoilova, 2021); and b) an index related to media multitasking behaviour while doing homework (henceforth IMMHW). There is a broad scientific consensus regarding the large presence of this behaviour among adolescents (Ettinger & Cohen, 2020) and its negative consequences on learning and academic performance, which are associated with high levels of distraction (Luo et al., 2020; Martín-Perpiñá et al. 2019b; Rogobete et al., 2021).

We also use the Big Five model (Costa & McCrae, 2004) to explore the personality profile of those adolescents who display low-risk behaviours with regard to ICT use. People who score highly on agreeableness (kind, friendly, trusting and trustworthy) and conscientiousness (responsible, hard-working and diligent) generally avoid badmouthing and seeking the attention of others (Seidman, 2013). In contrast, extroverted individuals (extroverted, gregarious and sociable) with high levels of neuroticism (depressed, fearful and anxious) and high openness to experience (creative, perceptive and reflective) tend to use ICTs to communicate more frequently (Marshall et al., 2015), and may therefore be more exposed to more high-risk behaviours of ICT use. A recent study on problematic social media use shows that high levels of extraversion and low openness are related to social media overuse and phubbing (an individual's withdrawal from interpersonal communication, p. 258), and low agreeableness with creeping (passive social media browsing, p. 259) and catfishing (altering one's identity on social media, p. 259) (Kav i et al., 2019). The intensive use of certain technologies among young people has a negative impact on their self-concept in general. Taking a sample of young university students, Castro-Sánchez et al. (2019) found that those who played video games less had a greater academic and social self-concept, while the most

intensive use of this technology had a negative impact, especially on academic self-concept. In respect of this, we can state that self-concept appears in abundant studies (carried out in different cultural contexts) as a protective factor against problematic behaviours with regard to the use of technologies that could predispose adolescents towards addiction (Arafa et al., 2019; Echeburúa, 2012). However, the issue of access to technologies is no longer related only to age (Holloway et al., 2013), but rather to the opportunity and model of use offered by the family with regard to digital device management. Aspects such as family members perceiving a high ICT use or not having rules for ICT use at home have been identified as risk factors when it comes to excessive use among the adolescent population (Martín-Perpiñá et al., 2019a; Malo-Cerrato et al., 2018). Recent research seems to indicate how the model of family technology consumption can interfere with the behaviour and development of the child at an increasingly younger age (Coyne et al., 2020). Furthermore, the family is the first interrelational context in which affective bonds are created among members. In recent years, numerous studies have explored the role that this type of attachment plays in relation to the addictive or problematic use of technologies among adolescents and young people. Kim and Koh (2018) observed how the avoidant attachment style, mediated through self-esteem and anxiety, explained addictive smartphone use among adolescents. Similarly, loneliness and depression appear as mediating psychological constructs between the insecure bond and smartphone addiction (Kim et al., 2017). Along the same lines, Ozteke et al. (2017) showed that preoccupied and dismissing attachment styles are predictors of problematic Internet use among young people. Other authors, such as Ching and Tak (2017), found that positive parenting styles - both authoritarian and permissive - are related to the development of secure bonds, which, in turn, generate a greater capacity for self-regulation in adolescents, the latter construct acting as a protective factor against addictive smartphone use. In order to address gaps in the previous literature, the aim of the present study is to explore the psychological and social profile of adolescents aged 13 to 18 who have been categorised as low-risk ICT users. Specifically, the profile of these subjects is explored in relation to:

- Their perceived level of digital self-efficacy, uses and attitudes towards ICTs.
- Their personality profile and self-concept in this regard.
- The family context in relation to the perception of ICT consumption.
- Relationships and attachment styles with family members.

Which of the variables explored increases or decreases the probability of low-risk ICT use behaviours at these ages?

2. Materials and methods

2.1. Participants

From a total population of 5,365 pupils studying secondary and upper secondary education and vocational training in the Alt Empordà region (Girona, Spain), a random sample ($n=1,218$) was selected using the multi-stage cluster sampling technique. The final sample comprised 997 students (90.5% participation) from six schools and colleges, mostly public (91.6%), in the province of Girona. A subsample of 593 participants aged 13 to 18 ($M=15.50$; $SD=1,240$) was selected for the purposes of this research, since these were the ones who responded to all of the scales explored in the study. With regard to gender, 55% were girls, and as for school year, the students were in Years 10 and 11 ($n=323$) or 12 and 13 ($n=244$) of secondary education, or in vocational training ($n=26$).

2.2. Instruments

2.2.1. Scales used to define low-risk ICT use

Index of Media Multi-tasking while doing homework (IMMHW). This index was calculated using an adaptation of the scale developed by Ophir et al. (2009). It was calculated from the question "How often do you do the following activities at the same time as studying or doing your homework? (1=never and 5=continuously)". The internal consistency for this study was .82. The Media and Technology Usage and Attitudes Scale (MTUA) (Rosen et al., 2013). This consists of 60 items grouped into 15 sub-scales that evaluate the frequency of use of and attitudes towards ICTs. Using the five-item scale referring to the Number of friends on Facebook/Instagram, which is evaluated on a 10-point numerical scale (0, 0-10,

10-50, 51-100, 101-175, 176-250, 251-375, 376-500, 501-750, 751 or more), the following question was used: “How many friends have you met online and never in person?”

List of items related to problems or negative experiences as a result of ICT use (mobile, tablet or computer) (created ad hoc by the authors and based on Livingstone et al., 2011): “I have had performance problems at school”; “I have used them excessively (I have spent more hours than usual on them)”; “I have lied or impersonated someone else”; “I have said inappropriate things”; “I have spent more money than I should have”; “I have consulted pages with inappropriate content for my age”. The response to this scale was dichotomous (Yes/No).

2.2.2. Scales used to analyse adolescents’ uses of and attitudes towards ICTs

Perceived digital self-efficacy (created ad hoc by the authors). The question used was: “To what degree do you think you master the following tools and applications: Word; Excel; PowerPoint; Prezzi; blog creation and edition; Google Drive or other cloud storage platforms such as iCloud or Dropbox; Facebook; Twitter; Instagram; WhatsApp; video creation and editing; participation in online debates or conversations”. This was evaluated on a scale from 1 (Not at all) to 5 (Very high). The Cronbach’s Alpha for this scale was .76. Media and Technology Usage and Attitudes Scale (MTUA) developed by Rosen et al. (2013). The frequency of use of the following subscales was explored: smartphone use; general social network use; Internet search; e-mail use; and use of media designed for sharing. In addition, the following subscales related to ICT attitudes were considered: positive (.74), negative (.63), and anxiety/technological dependence (.83). This was evaluated on a scale from 1 (Never) to 10 (Continually).

2.2.3. Scales used to determine personality profile

NEO Five Factor Inventory (Costa & McCrae, 2004): a shortened version of the NEO PI-R was used, which evaluates five personality traits and consists of 60 items (0= Totally disagree and 4= Totally agree). The Cronbach’s Alphas for each dimension were: Neuroticism .68, Extraversion .60, Openness to Experience .65, Agreeableness .53 and Conscientiousness .69. Catalan version of the AF5 Self-concept (Malo-Cerrato et al., 2014): consisting of 30 items and including the five dimensions (Family, Academic, Social, Emotional, Physical) (0=Never and 10=Always). The psychometric properties were very good for this study and similar to those of the original scale: internal consistency ranged from .75 (social) to .91 (academic).

2.2.4. Scales to determine family context for ICT use and affective family relationships

Self-attributed family ICT consumption type (version adapted from Casas et al., 2007). This is a single-item scale that asks participants about their perceptions regarding their parents’ (father/mother) consumption, based on five categories of responses (1=Your father/mother never or nearly never uses it; 2=Your father/mother is a low consumer; 3=Your father/mother is an average consumer; 4=Your father/mother is quite a high consumer; 5=Your father/mother is a very high consumer). Rules for ICT use at home (version adapted from Hiniker et al., 2016). A question was created with a dichotomous answer (Yes/No) to explore whether there are any established rules of use for ICTs (mobile, computer, tablet, etc.) at home. Spanish version of Cartes, Individual Relationship Models, reduced version (CaMir-R) (Balluerka et al., 2011). This short version of the CaMir test assesses the mental representation of seven attachment dimensions based on 32 five-point Likert response items (1=Strongly agree and 5=Strongly disagree): “Security: availability and support of attachment figures” being related to secure attachment; “Family concern” and “Parental interference” to an anxious insecure attachment; “Self-sufficiency and resentment towards parents” to an avoidant insecure attachment; and finally, “Childhood trauma” to the disorganized attachment. “Parental authority value” and “Parental overtolerance” are related to representations of the family structure. Internal consistency for this study ranged from .57 for “Parental authority value” to .84 for “Security”, with the exception of “Parental permission” (.45). These values corresponded to those detected in the study by Balluerka et al. (2011), who considered them acceptable for scales with fewer than eight items.

2.3. Procedure

Permission was requested from the Autonomous Government of Catalonia's Department of Education, the directors of the schools and colleges and the students' parent associations, reporting the objectives of the research. Confidentiality in the use of data and anonymity were guaranteed both to those in charge of the schools and colleges and to the participating adolescents. The questionnaire was divided into two parts to avoid subject fatigue, and was administered in their classrooms in two sessions of one hour, with the support of two investigators. It being a study involving human beings, the ethical norms of the 1964 Declaration of Helsinki and its subsequent modifications were followed.

2.4. Data analysis

Two groups were created to explore the general objective: a low-risk use group and a normative use group. These were determined according to three scales: 1) the IMMHW: the mean score of the index was calculated and a standard deviation (henceforth SD) was added ($2.38 + .71$).

Those participants who scored above the mean score of 3.09 were considered to have a higher IMMHW, while those who scored 1.67 or less (mean-1 SD) were considered to belong to the group with a low IMMHW; 2) the MTUA-S: those subjects who marked the options "0" friends and "1-10" friends (referring to Facebook/Instagram and their friends online) in response to the question "How many friends have you met online and never in person?" were selected, and 3) participants who responded that they had NOT experienced problems or negative experiences as a consequence of ICT use were also selected. The value "0" was assigned to the normative use group and "1" to the low-risk use group.

Chi-squared tests or t-tests were performed for the first fourth objectives, depending on the type of variables explored, and a forward stepwise binary logistic regression was carried out for the last objective in order to determine the explanatory variables for low-risk ICT use. All analyses were performed using the SPSS statistical package, version 27.0. The minimum level of statistical significance required in all tests was $p < .05$.

3. Analysis and findings

3.1. Socio-demographic profile and prevalence of the low-risk ICT use group

The prevalence of boys ($n = 12$) and girls ($n = 30$) comprising the low-risk ICT use group was 7.1% of the total, with the percentage of girls (71.4%) being significantly higher ($\chi^2 = 4.944$; $p = .026$) than that of boys. The mean age was 15.29 ($SD = 1.274$), with no statistically significant differences observed.

3.2. Perceived digital self-efficacy and uses of and attitudes towards ICTs

The participants in the low-risk ICT use group perceived themselves as being significantly more competent in the use of PowerPoint ($t_{(63.58)} = -3.266$; $p = 0.002$; $d = .89$), while they reported a lower mastery of Facebook ($t_{(46)} = 3.039$; $p = 0.004$; $d = 1.33$), Twitter ($t_{(50.88)} = 3.856$; $p < 0.005$; $d = 1.60$), Instagram ($t_{(45)} = 3.036$; $p = 0.004$; $d = 1.26$) and Whatsapp ($t_{(45.09)} = 2.510$; $p = 0.016$; $d = 0.68$), when compared to the other participants. They also reported less use of ICTs in relation to: activities that can be carried out using a smartphone (e.g. using mobile apps) ($t_{(591)} = 3.405$; $p = 0.001$; $d = 1.80$), social media in general (e.g. uploading photos to a social media platform) ($t_{(591)} = 4.450$; $p < 0.005$; $d = 1.92$), searching the Internet (e.g. for photos) ($t_{(591)} = 3.430$; $p = 0.001$; $d = 2.27$), sharing on social media (e.g. watching video clips on the computer) ($t_{(591)} = 2.651$; $p = 0.008$; $d = 1.87$), sending text messages ($t_{(591)} = 3.301$; $p < 0.005$; $d = 2.07$), making phone calls ($t_{(591)} = 2.112$; $p = 0.035$; $d = 2.25$), playing video games ($t_{(591)} = 3.375$; $p = 0.007$; $d = 2.35$) and watching TV ($t_{(591)} = 2.981$; $p = 0.003$; $d = 2.14$). This group also showed a significantly less dependent/anxious attitude towards ICTs ($t_{(47,163)} = 3.152$; $p = 0.003$; $d = 1.10$) than the normative use group.

3.3. Personality and self-concept

Statistically significant differences were observed in the dimensions of extraversion ($t_{(591)} = 1.960$; $p = 0.05$; $d = 6.03$), agreeableness ($t_{(591)} = -3.343$; $p = 0.001$; $d = 5.21$) and conscientiousness ($t_{(591)} = -4.929$; $p < 0.005$; $d = 5.93$): the low-risk ICT use group scored higher in conscientiousness and agreeableness and lower in extraversion. Regarding self-concept, differences were observed in reference

to academic self-concept ($t_{(56,617)} = -7.466$; $p < 0.005$; $d = 1.84$), the highest scores being found among the low-risk ICT use group.

3.4. Family context with regard to the use of ICTs

This study has explored how adolescents categorize their parents as ICT consumers, and no significant differences were observed between the two groups with regard to fathers and mothers. A total of 29.8% of the adolescents reported having rules at home when it comes to ICT use, with differences being statistically significant when comparing the two groups: 26.8% belonged to the low-risk ICT use group and the remaining 3% to the normative group ($\chi^2_{(1)} = 3.653$; $p = .05$).

3.5. Dimensions in CaMir-R

Regarding individual models of parental relationship and affective bonding, statistically significant differences were found for the factor “family concern” ($t_{(591)} = -2.117$; $p = .035$; $d = .77$), those adolescents who present a low-risk use of ICTs displaying less concerned attachment. Analysing all the items on this scale, significant differences appeared in: “I have the feeling that I would never get over the death of one of my loved ones” ($t_{(49,952)} = -3.428$; $p = .001$; $d = 1.28$), which corresponds to the family concern factor and “My parents have given me too much freedom to do anything I want” ($t_{(591)} = -1.912$; $p = .05$; $d = .94$), which refers to the factor parental permissiveness, representing family structure. The low-risk group of adolescents scored higher in both cases, which reflects greater disagreement with these statements.

3.6. Factors predicting low-risk ICT use

A binary logistic regression was carried out following the forward stepwise method (Wald). The dependent variable was low-risk ICT use, and those variables that showed a statistically significant relationship in the previous analyses were included as co-variables. The model correctly classified 92.9% of the participants and explained 28% of the variance (Nagelkerke’s $R^2 = .285$).

Those variables found to increase the probability of low-risk ICT use were as follows: reporting a high academic self-concept (OR = 1.573; IC 95% = 1.230–2.013), having a low perception of separation anxiety from one’s loved ones (OR = 1.448; IC 95% = 1.111–1.888) and a high score in the agreeableness dimension (OR = 1.074; IC 95% = 1.002–1.150); in contrast, being a boy (OR = .414; IC 95% = .187–.918), making greater use of social media in general (OR = .725; IC 95% = .598–.878), perceiving high self-efficacy in the use of Twitter (OR = .774; IC 95% = .603–.992) and a high level of TV use (OR = .823; IC 95% = .677–.999) reduce the likelihood of low-risk ICT use (Table 1).

Steps	Variables	B	E.T	Wald	df	p	OR	IC 95%
Step 7 (g)	Gender(1)	-.881	406	4.709	1	.030	.414	.187 918
	Twitter	-.257	127	4.104	1	.043	.774	.603 992
	AgreeablenessNEOFFIVIR	.071	.035	4.078	1	.043	1.074	1.002 1.150
	AF5_AcademicVIR	.453	126	13.003	1	.000	1.573	1.230 2.013
	MTU_GeneralSocialMediaUsageVIR	-.322	.098	10.760	1	.001	.725	.598 878
	MTUA_TVViewingVIR	-.195	.099	3.870	1	.049	.823	.677 999
	I have the feeling that I would never get over the death of one of my loved ones	.370	135	7.487	1	.006	1.448	1.111 1.888
	Constant	-5.948	1.505	15.625	1	.000	.003	

Note. Variable(s) introduced in step 1: AF5_AcademicVIR, b. Variables specified in step 2: MTU_GeneralSocialMediaUsageVIR, c. Variables specified in step 3: Twitter, d. Variables specified in step 4: I have the feeling that I would never get over the death of one of my loved ones, e. Variables specified in step 5: AgreeablenessNEOFFIVIR, f. Variables specified in step 6: Gender, g. Variables specified in step 7: MTUA_TVViewingVIR.

4. Discussion and conclusions

The main aim of this study was to describe the psychosocial profile of a sample of 13 to 18-year-old adolescents who present low-risk ICT behaviours. A higher prevalence of girls than boys was identified in the low-risk ICT use group and age does not seem to be a discriminating element. Of the total sample,

7.1% of the adolescents displayed low-risk ICT use. Although the digital gap between genders with regard to ICT access is decreasing (Smahel et al., 2020), some previous studies have confirmed that girls are more intensive users (Müller et al., 2017). In terms of risk behaviours, girls are more frequently identified with problematic situations as a consequence of the use of ICTs and social networks (Malo-Cerrato et al., 2018; Smahel et al., 2020). Furthermore, girls also speak more with their parents about what they do online (Smahel et al., 2020), this is considered a behaviour that protects against online risks (Durager & Livingstone, 2012). The results of the present study would seem to indicate that girls are at the two extremes when it comes to technology use: on the one hand, their use of ICTs and social networks is more excessive (high-risk), while on the other it is also more adaptive (low-risk). This points to the importance of carrying out differentiated psychoeducational interventions according to gender and type of use in order to promote online safety. The first of the specific objectives of the study was to explore the perceived level of digital self-efficacy, uses and attitudes towards ICTs. With regards to computer applications that may be related to greater ICT use in the academic field, such use is found to be more frequent among adolescents who present a low-risk behaviour with regard to ICT use. That being said, however, those adolescents who present a low-risk profile perceived themselves as having lower digital self-efficacy than other adolescents when it comes to tools used for more relational and communicative tasks. Furthermore, the two applications in which both groups perceived themselves as having greater digital competence were WhatsApp and Instagram (in that order), with those in the normative group scoring significantly higher in this regard. This greater perceived self-efficacy in the aforementioned social networks by the normative group may be explained by them accessing these applications more frequently for more social and recreational purposes, rather than educational ones. In this regard, previous research has indicated that providing and receiving social support online is a predictor of more intensive ICT use (Tang et al., 2016).

The second aim of this study was to determine the personality profile and self-concept of adolescents categorised within the low-risk ICT use group. Similarly, to studies that have identified differentiated personality characteristics between the group of adolescents who make excessive use of ICTs and the normative group (Helsper & Smahel, 2020; Kuss et al., 2020; Malo-Cerrato et al., 2018; Martín-Perpiñá et al., 2019a), this study also found different personality traits between those adolescents who present low-risk behaviours of ICT use and those who do not. The adolescents in the low-risk behaviour group were characterised as being sincerer, empathetic, considerate and supportive (high levels of agreeableness) and having greater self-discipline, sense of duty, order, punctuality and scrupulosity (greater conscientiousness), as well as lower levels of extraversion. These results may be related to previous findings, namely that the conscientiousness factor is a good predictor of healthy behaviours (Singh, 2022), and that agreeableness and conscientiousness are related to a lower risk of developing addictive behaviours, even defining them as protective factors in the use of ICTs (Schou-Andreassen et al., 2013; Martín-Perpiñá et al., 2019a). Regarding the lower extraversion scores, these could be explained by a lower desire for social interaction among this group of adolescents. High extraversion is related to risky behaviours such as problematic use of ICTs (Atroszko et al., 2018; Panda & Jain, 2018; Kav i et al., 2019), which is, in turn, associated with a greater need to be in contact with people (Marshall et al., 2015) and having an impulsive and carefree character. In contrast, low scores in this regard are a distinctive feature of the personality profile of adolescents with low-risk behaviours in ICT use, defining them as individuals with a high sense of duty, greater self-discipline and high self-control (Costa & McRae, 2004).

Regarding self-concept, this turns out to also be a differentiating construct between the two profiles in terms of the academic dimension. Adolescents in the low-risk ICT use group award themselves a higher self-assessment in the academic world (in relation to their teachers, classmates and themselves), and therefore report being more satisfied with their role as students than those in the normative group. This result could be related to previous findings that high self-esteem and high self-concept in adolescents have been considered a protective factor when it comes to addictions to ICTs and social networks (Echeburúa, 2012), and that academic self-concept is a protective factor against their excessive use (Arafa et al., 2019; Castro-Sánchez et al., 2019; Wachs et al., 2020). The third aim of this work was to explore the role played by how adolescents perceive their parents' ICT consumption. Although statistically significant differences

were not observed between the two groups of ICT users, according to the adolescents' perceptions, it is suspected that there is generally little mediation and normative regulation on the part of the family nucleus in this regard. The data show that 70% of the adolescents studied reported not having norms related to ICT use at home. In addition, among those who did perceive there to be some, the highest percentage corresponded to the low-risk ICT use group. These results may indicate an absence of or scarce parental supervision, with non-existent or inconsistent norms, far from promoting adaptive ICT use within the family context (Echeburúa, 2012). This idea is reinforced in the present study, since when exploring the parental relationship and affective bonding (fourth objective), it was found that those adolescents with low-risk ICT behaviour perceived having a less permissive family structure, as well as a less concerned and more secure attachment style, in line with previous studies (Kim et al., 2017; Ozteke et al., 2017). In light of these results, it is worth emphasising the need to provide adults with effective tools, given that, in their role as models of consumption, they must provide their children with effective media regulation strategies adapted to the times in which we live and the demands and needs of each adolescent (Durager & Livingstone, 2012; Zaman et al., 2016), thereby progressively promoting greater autonomy in decision-making and in the security that this accompaniment offers adolescents (Livingstone et al., 2017). With regard to the final aim, those variables that increase the probability of low-risk ICT use were found to be high academic self-concept, low perception of separation anxiety from loved ones and high levels of agreeableness. In contrast, being a boy, having a high use of social media in general, perceiving a high self-efficacy in the use of Twitter and having a high consumption of television were found to reduce the likelihood of low-risk behaviours in relation to ICT use.

By way of conclusion, in response to a current psycho-socio-educational need in the field, this study adopted a scientific approach to the concept of low-risk ICT use among adolescents. The subject matter is both original and novel, because it is in an incipient phase where there is no substantial theoretical framework of reference (Gudmundsdottir et al., 2020). Although much of the literature focuses on the negative consequences that high-risk ICT behaviours (such as excessive or addictive use) can entail, it is relevant to continue contributing new scientific data and studies that allow the documentation of, and support for, interventions based on preventing and promoting healthy ICT use. In response to the main research question, the study confirms that low-risk ICT use results from a combination of variables of a more personal nature, as well as elements from the social context. Fostering psychological aspects such as conscientiousness, agreeableness and the capacity for self-regulation may prove to be key elements in healthy ICT use. Specific adolescent interventions should be developed in order to promote empathy, prosociality and social skills (related to agreeableness) on the one hand, and psychoeducation for the teaching of self-conscientiousness strategies and self-control (related to conscientiousness) on the other. Thus, a central element in avoiding risky behaviours with regard to ICT use will be the provision of actions that allow children and adolescents to develop socio-emotional skills, such as good academic self-concept or the development of positive relationships in the school and in the family contexts (OECD, 2015). The new media literacy points in this direction by highlighting the relevance of learning in order to work collaboratively, within a network, critically and respecting the opinions of others. Furthermore, this study reinforces the relevant role of relational and affective bonding models with the family nucleus. As recent studies have pointed out, positive parental models that generate secure relationships are the basis for fostering a capacity for autonomy and self-regulation among boys and girls, protecting them from the potential risks associated with less adaptive or functional ICT use (Prats-Fernández et al., 2018). This must be accompanied by models of media regulation, bearing in mind the characteristics of each family and the age and psychological maturity of the children.

This study has its limitations. The sample is representative of a specific age group and region, which must be taken into account when extrapolating the results to other social and cultural contexts. The measurement instruments are self-reported, which could also lead to a bias when collecting data. Future studies should therefore be supplemented with more objective data, such as hours of consumption and other such indicators currently available on smartphones. As it is a cross-sectional study, the importance of collecting data in a systematic way in order to establish causal relationships was paramount. The regression model explained a moderate variance (28%), which indicates that there are probably other

variables related to personality and the social context that should be included in future research when investigating the profiles of adolescents in this area.

Authors' Contribution

Idea, S.M., M.M.; Literature review (state of the art), S.M.; Methodology, M.G.C.; Data analysis, S.M.; Results, M.M., M.G.C.; Discussion and conclusions, S.M., M.M., M.G.C.; Writing (original draft), S.M., M.M.; Final revisions, S.M., M.M., M.G.C.; Project design and sponsorship, S.M., M.M.

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