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Parental Knowledge and Adolescent Adjustment: Substance use and Health-Related Quality of Life

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This study analyses two models (maternal and paternal) in which parental care and sources of parental knowledge moderated the relationship between parents' knowledge about their adolescents' lives and adolescents' substance use and health-related quality of life. The sample was made up of 15942 Spanish adolescents who participated in the 2006 edition of Health Behavior in School-aged Children Study. Results showed that increased parents' knowledge about their adolescents' lives reduced adolescents' substance use and increased their quality of life. With respect to the moderation relationship, a limited effect was found. However, parental care and sources of parental knowledge used by both parents generally had main effects on adolescents' substance use and health-related quality of life, with care being the most relevant variable in the health-related quality of life, while knowledge was the most relevant one for substance use.
Keywords: parental knowledge, substance use, health-related quality of life.

Este trabajo analiza dos modelos (materno y paterno) en los que el afecto parental y los procedimientos de obtención del conocimiento parental moderaron la relación entre el conocimiento que los padres tenían sobre la vida de sus hijos adolescentes con el consumo de sustancias y la calidad de vida relacionada con la salud de éstos. La muestra estuvo compuesta por 15.942 adolescentes españoles que participaron en la edición 2006 del estudio Health Behavior in School-Aged Children. Los resultados mostraron que el conocimiento que los padres tenían sobre las vidas de sus hijos redujo su consumo de sustancias e incrementó su calidad de vida. Respecto a las relaciones de moderación, se encontró que tenían un efecto pequeño, aunque el afecto parental y los procedimientos de obtención del conocimiento parental utilizados por ambos progenitores, tuvieron efectos principales sobre las variables de consumo de sustancias y calidad de vida, siendo el afecto la variable más relevante en la calidad de vida relacionada con la salud, mientras que el conocimiento lo fue para el consumo de sustancias.
Palabras clave: conocimiento parental, consumo de sustancias, calidad de vida relacionada con la salud.

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Parental monitoring, a type of behavioral control, has been given a number of definitions throughout the development of its scientific approach. In an in-depth review of the research on parental monitoring, Dishion and McMahon (1998) loosely defined it as "a set of correlated parenting behaviors involving attention to and tracking of the child's whereabouts, activities, and adaptations" (p. 61). Foreseeing the course of certain research in this field today, they also noted that the basis of parental monitoring is the quality of the parent-child relationship: "a positive parent-child relationship enhances parents' motivation to monitor their child and to use healthy behavior management practices" (p. 64).

Later, Stattin and Kerr (2000), in keeping with the way in which the monitoring had been evaluated, defined it "as parents' knowledge of the child's whereabouts, activities, and associations" (p. 1074). They debated that the way to measure control in the educational style had essentially consisted in evaluating what the parents *knew* about their children's behavior, understanding that *control* is synonymous to *knowledge,* without differentiating between them. Neither had research on this topic analysed how this knowledge was obtained, which these authors considered relevant. Thus, in a series of studies based on self-assessment, these authors differentiated three ways in which parents obtained knowledge about their children: child disclosure, parental solicitation, and parental control. This distinction is fundamental for two reasons, which are related to the authors' findings: first, greater parental knowledge was generally related to what children had told their parents spontaneously and secondly, this child disclosure was the best predictor of children's adjustment (Kerr & Stattin, 2000; Stattin & Kerr, 2000).

These results suggest that the term monitoring must be reserved for measures that involve active efforts of the parents to obtain information from their children. Therefore, when evaluating parental knowledge (as in this research) the concept must be labelled as such (Stattin & Kerr, 2000).

Regarding the evolution of parental knowledge during adolescence, boys and girls tend to see themselves as less obliged to reveal information to their parents about their conducts (Smetana, Metzger, Gettman, & Campione-Barr, 2006) and usually keep more secrets to their parents (Finkenauer, Engels, & Meeus, 2002).

In terms of gender differences in the perception of parental knowledge, variations have been found between boys and girls. Despite both girls and boys disclosing more information to their mothers than to their fathers, girls share more information with their mothers, while the boys keep more secrets (Moreno, Muñoz-Tinoco, Pérez-Moreno, & Sánchez-Queija, 2005; Smetana, Metzger, et al., 2006). Consequently, mothers know more about their adolescents' activities (Crouter, Bumpus, Davis, & McHale, 2005; Moreno et al., 2005; Waizenhofer, Buchanan, & Jackson-Newsom, 2004). Furthermore, boys lie more often than girls (Engels, Finkeanuer, & van Kooten, 2006), and girls show a greater tendency towards voluntary sharing information about their activities with their parents (Waizenhofer et al., 2004).

Finally, it's important to mention that parental knowledge is especially important during adolescence, since this is a period in which opportunities of taking part in problematic activities increase, while direct parental supervision decreases (Jacobson & Crockett, 2000). In this sense, parental knowledge has been identified as an important component of effective parenting, being related to better adjustment in adolescents (Laird, Pettit, Dodge, & Bates, 2003), lower substance use (Chilcoat & Anthony, 1996; Steinberg, Fletcher, & Darling, 1994), and higher wellbeing (Fröjd, Kaltiala-Heino, & Rimpelä, 2007; Graber, Nichols, Lynne, Brooks-Gunn, & Botvin, 2006). An important aspect of wellbeing is health-related quality of life, which has been defined as a multidimensional construct covering physical, emotional, mental, social, and behavioral components of wellbeing (The KIDSCREEN Group Europe, 2006). Therefore, during adolescence, it is advisable that parents are well informed about their children's activities, who their friends are, and the places where they go, and it's also important that parents have an open, honest, and close parent-child relationship.

The current work takes its data from the results obtained during the 2006 Health Behavior in School-aged Children (HBSC) Study in Spain. The aim of this research is to analyze how and to what degree the relationship between parental knowledge and adolescents' substance use, on one side, and health-related quality of life, on the other, is moderated by parental care and by the sources of parental knowledge considered in this study: adolescent disclosure, parental solicitation, non-communication and bidirectional communication. This work is also interested in analysing the different role of maternal and paternal variables in those relationships.

Method

Participants

The participants in this study came from a representative sample of the Spanish adolescent population. A random multi-stage sampling procedure stratified by conglomerates (taking into account: age, region of Spain, residence -rural and urban-, and type of educational centre -public or private-) was used to select 21 811 adolescents between the ages of 11 and18. Approximately 84% came from two-parent families, and 10% came from single-parent families.

The sample of this study consisted of 15 942 adolescents, 46.66% boys and 53.34% girls, aged 13 to 18.

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Measures

The HBSC questionnaire is a broad survey that reveals the adolescent health habits from a multidisciplinary perspective. For this paper the selected variables were:

Perceived parental knowledge. This scale has been taken from Brown, Mounts, Lamborn, and Steinberg (1993). The scores range from *5* (low knowledge) to *15* (high knowledge). The reliability in this study is .75 for maternal knowledge, and .84 for paternal knowledge.

Perceived parental care, from 1 (low care) to 3 (high care). This scale is based on the care dimension from the Parental Bonding Inventory-Brief Current form (PBI-BC) (Klimidis, Minas, & Ata, 1992). In this study, the reliability is .75 for maternal care, and .81 for paternal care.

Sources of parental knowledge. Four groups were created for the father and mother separately, after crossing: parental solicitation (In general, my mother/my father knows about these things because she/he asks me directly and I tell her/him) and adolescent disclosure (In general, my mother/my father knows about these things because I tell her/him spontaneously, even if she/he doesn't ask), with four options each (never, almost never, almost always, and always), in the following manner: self-disclosure group (boys and girls who respond that they self-disclose almost always or always, and never or almost never did their parents ask about their activities), parental solicitation group (boys and girls that marked never or almost never in their self-disclosure, but almost always or always perceived parental solicitation from their fathers and mothers), non-communication group (boys and girls that declared never or almost never in the self-disclosure nor were their parents interested in their activities), and bidirectional communication group (boys and girls who almost always or always self-disclose and, at the same time, perceived parental solicitation).

Substance use. It included tobacco use (How often do you smoke tobacco at present? with four values: I do not smoke, less than once a week, at least once a week, but not every day, every day); alcohol use (Maximum frequency of current consumption of alcoholic beverages-beer, wine, liquors, and others type-, with five values: never, rarely, every month, every week, every day); and cannabis use (Have you ever used cannabis in the past 30 days?, with seven values: never, once or twice, 3 to 5 times, 6 to 9 times, 10 to 19 times, 20 to 39 times, 40 times or more). It is necessary to comment that the items related with tobacco and alcohol use have been included from the first data collection HBSC study, demonstrating its usefulness to assess these risk behaviors (Hublet & Godeau, 2005; Schmid, Fotiou, Godeau, Simons-Morton, & Hublet, 2005). As for the items about cannabis use, they were included in the 2001/2002 data collection, adapted from the ESPAD (European School Survey Project on Alcohol & other Drugs) (Hibell et al., 2000), and also have been proven useful to assess cannabis use in adolescents.

Health-related quality of life. This variable is quantitatively measured, with mean 50 and standard deviation of 10. The reliability in this study is .80. It is based on the KIDSCREEN-10 index questionnaire, which provides a global index of the quality of life (The KIDSCREEN Group Europe, 2006).

Procedure

In the data collection procedure, the HBSC international organization dictates that three conditions must be fulfilled: adolescents must be the ones who answer the questionnaire; anonymity of the answers must be guaranteed; and, the administration of the questionnaires must be done within the school context and by trained staff.

Results

Preliminary analyses

As shown in Table 1, in comparison to boys, girls had a higher level of tobacco and alcohol use but a lower cannabis use, as well as a worse quality of life, with these differences being significant, excluding the case of cannabis. In respect to the sources of paternal and maternal knowledge, in both cases, the non-communication source entailed average scores of tobacco, alcohol and cannabis use to be higher and the average scores of quality of life to be lower; whilst the bidirectional communication source resulted in lower average scores of consumption for these substances and higher quality of life, all of which were significant differences.

Table 2 shows correlations between age, knowledge, care, substance use, and quality of life. Parental knowledge, parental care and quality of life decreased in older adolescents whereas tobacco, alcohol and cannabis use increased. Besides, substance use correlated negatively with care and knowledge, thus, the greater the parental knowledge and parental care the lesser the substance use, both in the case of fathers and of mothers. In terms of quality of life, just the opposite happened; knowledge and care were positively associated and there was also a significant positive association between parental knowledge and care and quality of life.

Regression Analysis

In order to evaluate how parental care and the sources of parental knowledge affect the relationship between knowledge and substances use (tobacco, alcohol and cannabis), and knowledge and health-related quality of life, a multiple linear regression analysis was used, with separate analysis for the mother and the father. Age and gender were statistically controlled, and they were included in the first

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Table 1
Descriptive statistics and test of significance of tobacco use, alcohol use, cannabis use, and health-related quality of life, depending on gender and the sources of parental knowledge among 13-18 years-old Spanish adolescents

Variable	Tobacco use		Alcohol use		Cannabis use		Health-Related Quality of Life	
	Mean (*SD*)	Test of Significance	Mean (*SD*)	Test of Significance	Mean (*SD*)	Test of Significance	Mean (*SD*)	Test of Significance
Gender								
Boy	1.41 (0.95)	$t(15\ 635) = 12.89^{**}$	2.38 (1.22)	$t(14\ 842)$ 2.17*	1.41 (1.23)	$t(14\ 610) = -1.65$	49.31 (9.71)	$t(14\ 647) = -13.72^{**}$
Girl	1.62 (1.11)		2.42 (1.15)		1.38 (1.10)		47.16 (9.54)	
Sources of maternal knowledge								
Adolescent disclosure	1.52 (1.05)		2.30 (1.14)		1.32 (1.04)		48.18 (9.64)	
Parental solicitation	1.58 (1.08)	$F(3, 15\ 229) = 112.63^{**}$	2.60 (1.17)	$F(3, 14\ 972) = 180.25^{**}$	1.49 (1.29)	$F(3, 15\ 121) = 120.61^{**}$	46.99 (9.20)	$F(3, 14\ 739) = 150.47^{**}$
Non-communication	1.96 (1.26)		2.81 (1.19)		1.86 (1.71)		44.48 (10.51)	
Bidirectional communication	1.40 (0.94)		2.20 (1.15)		1.25 (0.89)		49.75 (9.50)	
Sources of paternal knowledge								
Adolescent disclosure	1.46 (1.01)		2.33 (1.19)		1.37 (1.12)		48.38 (9.45)	
Parental solicitation	1.55 (1.06)	$F(3, 14\ 724) = 102.82^{**}$	2.53 (1.17)	$F(3, 14\ 471) = 176.89^{**}$	1.44 (1.22)	$F(3, 14\ 622) = 64.35^{**}$	47.65 (8.99)	$F(3, 14\ 255) = 234.45^{**}$
Non-communication	1.73 (1.17)		2.66 (1.16)		1.56 (1.38)		45.31 (9.60)	
Bidirectional communication	1.34 (0.88)		2.11 (1.16)		1.22 (0.85)		50.79 (9.65)	

$^{*}p < .05$ $^{**}p < .01$

Table 2
Descriptive statistics and correlations of age, parental knowledge, parental care, tobacco use, alcohol use, cannabis use, and health-related quality of life among 13-18 years-old Spanish adolescents

Variable	*N*	Mean (*SD*)	1	2	3	4	5	6	7	8	9
1. Age	15 942	15.56 (1.71)	1	–.03**	–.06**	–.11**	–.15**	.28**	.51**	.23**	–.14**
2. Maternal knowledge	15 395	13.52 (1.84)		1	.61**	.4**	.27**	–.25**	–.25**	–.26**	.21**
3. Paternal knowledge	14 827	12.12 (2.64)			1	.31**	.54**	–.20**	–.21**	–.18**	.23**
4. Maternal care	15 552	2.64 (0.41)				1	.50**	–.12**	–.15**	–.12**	.31**
5. Paternal care	14 894	2.44 (0.51)					1	–.13**	–.16**	–.10**	.29**
6. Tobacco use	15 650	1.52 (1.04)						1	.47**	.55**	–.13**
7. Alcohol use	15 372	2.4 (1.18)							1	.39**	–.13**
8. Cannabis use	15 517	1.4 (1.17)								1	–.08**
9. Health-Related Quality of Life	15 085	48.15 (9.68)									1

$^{**}p < .01$ $^{***}p < .0001$

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phase of the regression equation. In the second phase, the variables parental knowledge, parental care and sources of parental knowledge (specifically adolescent disclosure, parental solicitation and non-communication sources) were included. In a third phase, the interactions between parental care and the sources of parental knowledge with parental knowledge were introduced.

Maternal knowledge and tobacco use

In Table 3, demographic variables are shown to contribute significantly to the prediction of tobacco use: the older the adolescent, the greater the tobacco use (t = 34.56, β = .27, p < .001) and tobacco consumption was lower in boys than in girls (t = -11.27, β = -.09, p < .001). Greater maternal knowledge also bore influence on lower consumption (t = -25.69, β = -.23, p < .001), even though maternal care contributed to increase it (t = 2.42, β = .02, p = .016) although with lower scores. Regarding the sources of maternal knowledge, maternal solicitation slightly increased tobacco use (t = 2.48, β = .02, p = .013), and non-communication increased this use even more (t = 6.98, β = .06, p < .001) when compared to the bidirectional communication source.

Maternal knowledge and alcohol use

Table 4 shows that of the two demographic variables, only age contributed significantly to the prediction of alcohol consumption; thus, both older girls and boys showed higher alcohol use (t = 71.77, β = .51, p < .001). In the case of maternal knowledge, higher levels influenced lower consumption (t = -25.07, β = -.20, p < .001). Regarding the sources of maternal knowledge, with respect to the bidirectional communication source, both maternal solicitation (t = 11.72, β = .09, p < .001) and non-communication sources (t = 7.47, β = .06, p < .001) bore with them increased alcohol use. On the contrary, no differences were found (t = 0.81, β = .01, p = .416) in the adolescents' consumption when comparing disclosure with the bidirectional communication source, nor does maternal care had a statistical effect on alcohol use (t = 1.59, β = .01, p = .111).

Differing from what occurred with tobacco use, the interactions between knowledge and care were significant for alcohol use (t = -2.63, β = -.02, p = .009), which implied that the reduction in alcohol use associated to increases of knowledge became even greater as care increased (-.02). The interactions of maternal solicitation (t = 3.04, β = .04, p = .002) and the non-communication source (t = 3.57, β = .05, p < .001) with knowledge were also significant, and in both cases implied a reduction in the effect of knowledge on alcohol use (-.09 and -.07 respectively). However, the effect of these interactions was very small.

Maternal knowledge and cannabis use

Table 5 shows that both gender and age significantly predicted cannabis use: older boys and girls (t = 28.99, β = .23, p < .001) and the boys more than the girls (t = 2.88, β = .02, p = .004) had a greater consumption of this substance. The same as with tobacco use, greater maternal knowledge had an influence on lower consumption (t = -24.96, β = -.23, p < .001), whereas maternal care

Table 3
Multiple linear regression analysis of tobacco use among 13-18 years-old Spanish adolescents with maternal variables

	B	*SE*	β	R^2	ΔR^2	Df	ΔF
Step 1				.09	.09	2	682.56**
Gender	–.19	.02	–.09**				
Age	.17	.01	.27**				
Step 2				.15	.07	5	228.36**
Maternal knowledge	–.13	.01	–.23**				
Maternal care	.05	.02	.02*				
Adolescent disclosure	.05	.03	.01				
Parental solicitation	.05	.02	.02*				
Non-communication	.24	.04	.06**				
Step 3				.15	.00	4	0.37
Maternal knowledge × Maternal care	.00	.01	.00				
Maternal knowledge × Adolescent disclosure	–.01	.02	–.01				
Maternal knowledge × Parental solicitation	–.01	.01	–.02				
Maternal knowledge × Non-communication	–.004	.02	–.004				

*p < .05 **p < .01

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Table 4
Multiple linear regression analysis of alcohol use among 13-18 years-old Spanish adolescents with maternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.26	.26	2	578.67**
Gender	.02	.02	.01				
Age	.36	.01	.51**				
Step 2				.33	.06	5	273.23**
Maternal knowledge	–.13	.01	–.2**				
Maternal care	.04	.02	.01				
Adolescent disclosure	.02	.03	.01				
Parental solicitation	.22	.02	.09**				
Non-communication	.26	.04	.06**				
Step 3				.33	.002	4	8.6**
Maternal knowledge × Maternal care	–.02	.01	–.02*				
Maternal knowledge × Adolescent disclosure	.02	.02	.01				
Maternal knowledge × Parental solicitation	.04	.01	.04**				
Maternal knowledge × Non-communication	.06	.02	.05**				

*$p < .05$ **$p < .01$

Table 5
Multiple linear regression analysis of cannabis use among 13-18 years-old Spanish adolescents with maternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.05	.05	2	421.29**
Gender	.05	.02	.02**				
Age	.16	.01	.23**				
Step 2				.12	.06	5	204.17**
Maternal knowledge	–.15	.01	–.23**				
Maternal care	.05	.03	.02*				
Adolescent disclosure	–.002	.03	.00				
Parental solicitation	.06	.02	.02*				
Non-communication	.19	.04	.04**				
Step 3				.12	.001	4	3.55*
Maternal knowledge × Maternal care	–.003	.01	–.003				
Maternal knowledge × Adolescent disclosure	–.04	.02	–.02				
Maternal knowledge × Parental solicitation	–.04	.01	–.03*				
Maternal knowledge × Non-communication	–.06	.02	–.05**				

*$p < .05$ **$p < .01$

contributed to its increase (t = 2.03, β = .02, p = .043) although with limited importance. With regards to the sources of maternal knowledge, both maternal solicitation (t = 2.69, β = .02, p = .007), and the non-communication source (t = 4.7, β = .04, $p < .001$) showed increased cannabis use when compared to the bidirectional communication source. Like in tobacco and alcohol use, no differences were found between adolescent disclosure and bidirectional communication in cannabis use (t = -0.05, β = .00, p = .961).

With regards to the interaction, both maternal solicitation (t = -2.49, β = -.03, p = .013) and the non-communication source (t = -3.48, β = -.05, $p < .001$) increased the effect of knowledge on cannabis use (-0.19 and -0.21) respectively. Nevertheless, the influence of this on the model was not very noticeable.

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Maternal knowledge and health-related quality of life

As can be seen in Table 6, the demographic variables of gender and age predicted (although in a less noticeable way than in substance use) the quality of life of girls and boys, to the extent that the greater the age, the lower the quality of life (t = -17.61, β = -.15, p < .001) and the girls (t = 12.33, β = .1, p < .001) had lower levels of quality of life than the boys. The quality of life was also positively related with maternal knowledge (t = 8.86, β = .08, p < .001), as well as with care (t = 28.15, β = .25, p < .001). With regards to the sources of maternal knowledge, in all cases, the mean quality of life was statistically lower with adolescent disclosure source (t = -2.74, β = -.02, p = .006) than with bidirectional communication. The differences were even greater when comparing maternal solicitation (t = -7.87, β = -.07, p < .001) and the non-communication source (t = -4.39, β = -.04, p < .001) with the bidirectional communication source.

In phase three, maternal care (t = 5.44, β = .06, p < .001) was seen to have a moderating effect on the relationship between knowledge and quality of life, increasing the effect that maternal knowledge had on the quality of life by .48. In the same way, disclosure (t = 2.29, β = .02, p = .02) increased the effect of knowledge on the quality of life by .43. However, these interactions bore only limited influence.

Paternal knowledge and tobacco use

Table 7 shows that the demographic variables contributed significantly to the prediction of tobacco use: the greater the age, the greater the tobacco use (t = 33.82, β = .27, p < .001) and that the boys consumed less than the girls (t = -10.8, β = -.09, p < .001). High paternal knowledge bore influence on a lower consumption (t = -17.64, β = -.18, p < .001), and paternal care increased the consumption (t = 3.01, β = .03, p = .003) although with limited importance. With regards to the sources of paternal knowledge, only the non-communication source, when compared with the bidirectional communication source (t = 3.76, β = .04, p < .001), contributed to an increase in tobacco use.

Paternal knowledge and alcohol use

In Table 8, of the two demographic variables, only age contributed significantly to the prediction of alcohol use, thus older girls and boys had a greater consumption (t = 70.64, β = .51, p < .001). With regards to paternal knowledge, higher levels influenced a lower consumption (t = -18.51, β = -.17, p < .001), while care, although to a reduced degree, increased it (t = 4.04, β = .04, p < .001). With regards to the sources of paternal knowledge, both paternal solicitation (t = 8.31, β = .07, p < .001) and non-communication (t = 7.53, β = .07, p < .001) showed average scores of alcohol use that were statistically higher than those shown for the group from the bidirectional communication source.

In phase 3, only the interaction between paternal knowledge and paternal care (t = -2.64, β = -.03, p = .008) was significant and in this case, paternal care increased the effect that knowledge had on the reduction of alcohol use. Nevertheless, the said interaction had limited importance.

Table 6
Multiple linear regression analysis of health-related quality of life among 13-18 years-old Spanish adolescents with maternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.03	.03	2	242.09**
Gender	1.96	.16	.10**				
Age	–.82	.05	–.15**				
Step 2				.13	.1	5	334.66**
Maternal knowledge	.43	.05	.08**				
Maternal care	5.73	.2	.25**				
Adolescent disclosure	–.73	.27	–.02*				
Parental solicitation	–1.4	.18	–.07**				
Non-communication	–1.46	.33	–.04**				
Step 3				.14	.003	4	10.83**
Maternal knowledge × Maternal care	.48	.09	.06**				
Maternal knowledge × Adolescent disclosure	.43	.19	.02*				
Maternal knowledge × Parental solicitation	–.14	.12	–.02				
Maternal knowledge × Non-communication	.18	.16	.02				

*p < .05 **p < .01

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Table 7
Multiple linear regression analysis of tobacco use among 13-18 years-old Spanish adolescents with paternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.08	.08	2	651.56**
Gender	–.18	.02	–.09**				
Age	.17	.01	.27**				
Step 2				.12	.03	5	109.36**
Paternal knowledge	–.07	.004	–.18**				
Paternal care	.06	.02	.03**				
Adolescent disclosure	–.02	.03	–.01				
Parental solicitation	.04	.02	.02				
Non-communication	.10	.03	.04**				
Step 3				.12	.00	4	1.10
Paternal knowledge × Paternal care	.01	.01	.02				
Paternal knowledge × Adolescent disclosure	.01	.01	.01				
Paternal knowledge × Parental solicitation	–.01	.01	–.01				
Paternal knowledge × Non-communication	.004	.01	.01				

*$p < .05$ **$p < .01$

Table 8
Multiple linear regression analysis of alcohol use among 13-18 years-old Spanish adolescents with paternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.26	.26	2	497.73**
Gender	.02	.02	.01				
Age	.36	.01	.51**				
Step 2				.3	.04	5	152.02**
Paternal knowledge	–.08	.004	–.17**				
Paternal care	.08	.02	.04**				
Adolescent disclosure	.03	.03	.01				
Parental solicitation	.18	.02	.07**				
Non-communication	.20	.03	.07**				
Step 3				.3	.001	4	4.90**
Paternal knowledge × Paternal care	–.02	.01	–.03*				
Paternal knowledge × Adolescent disclosure	.01	.01	.01				
Paternal knowledge × Parental solicitation	.01	.01	.01				
Paternal knowledge × Non-communication	.02	.01	.03				

*$p < .05$ **$p < .01$

Paternal knowledge and cannabis use

As can be seen in Table 9, the two demographic variables (gender and age) predicted cannabis use significantly: older girls and boys (t = 27.99, β = .23, $p < .001$) and the boys more than the girls (t = 3.38, β = .03, p = .001) had higher levels of consumption of this substance. The same as occurred with tobacco and alcohol use, a high paternal knowledge influenced a lower consumption (t = -16.12, β = -.17, $p < .001$), and a high paternal care contributed to increase it (t = 3.34, β = .03, p = .001) although with limited importance. With regards to the sources of paternal knowledge, both paternal solicitation (t = 2.64, β = .03, p = .008) and non-communication (t = 2.38, β = .03, p = .017) contributed to a raised level of cannabis use when compared with the bidirectional communication source.

Phase 3 showed that there was a moderating effect of both paternal solicitation (t = -2.41, β = -.03, p = .016) and the non-communication source (t = -2.68, β = -.05, p = .007) over the relationship between paternal knowledge and cannabis consumption. However, this effect was not statistically important.

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Table 9
Multiple linear regression analysis of cannabis use among 13-18 years-old Spanish adolescents with paternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.05	.05	2	393.72**
Gender	.06	.02	.03**				
Age	.16	.01	.23**				
Step 2				.08	.03	5	81.54**
Paternal knowledge	–.07	.01	–.17**				
Paternal care	.08	.02	.03**				
Adolescent disclosure	.04	.03	.01				
Parental solicitation	.07	.03	.03*				
Non-communication	.07	.03	.03*				
Step 3				.08	.001	4	3.56*
Paternal knowledge × Paternal care	.00	.01	.00				
Paternal knowledge × Adolescent disclosure	.003	.02	.002				
Paternal knowledge × Parental solicitation	–.03	.01	–.03*				
Paternal knowledge × Non-communication	–.03	.01	–.05*				

*$p < .05$ **$p < .01$

Table 10
Multiple linear regression analysis of health-related quality of life among 13-18 years-old Spanish adolescents with paternal variables

	B	*SE*	β	R^2	ΔR^2	*df*	ΔF
Step 1				.03	.03	2	231.66**
Gender	1.91	.16	.10**				
Age	–.82	.05	–.15**				
Step 2				.12	.08	5	260.91**
Paternal knowledge	.30	.04	.08**				
Paternal care	3.65	.19	.2**				
Adolescent disclosure	–1.04	.26	–.04**				
Parental solicitation	–1.43	.20	–.07**				
Non-communication	–1.74	.25	–.08**				
Step 3				.12	.01	4	19.48**
Paternal knowledge × Paternal care	.39	.06	.08**				
Paternal knowledge × Adolescent disclosure	–.49	.13	–.04**				
Paternal knowledge × Parental solicitation	–.36	.10	–.05**				
Paternal knowledge × Non-communication	–.06	.11	–.01				

*$p < .05$ **$p < .01$

Paternal knowledge and health-related quality of life

Table 10 shows that the demographic variables, gender and age, predicted (although in a less marked manner than in substance use) the quality of life of girls and boys: the older they were, the lower their quality of life (t = -17.38, β = -.15, $p < .001$) and the girls (t = 11.83, β = .1, $p < .001$) showed lower levels of quality of life. High paternal knowledge influenced a better quality of life (t = 7.89, β = .08, $p < .001$), the same as a high paternal care (t = 19.75, β = .2, $p < .001$), this latter (like in the case of maternal care) was the most important variable for predicting better levels of quality of life. With regards to the sources of paternal knowledge, all reduced the quality of life when compared with the bidirectional communication source: adolescent disclosure (t = -3.95, β = -.04, $p < .001$) and, to a greater extent, paternal solicitation (t = -7.05, β = -.07, $p < .001$) and non-communication (t = -7.02, β = -.08, $p < .001$).

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With regards to the interactions, although these had a limited influence, the moderating effect of care over the relationship of knowledge with the quality of life was demonstrated (t = 6.69, β = .08, p < .001), in such a way that the effect of knowledge over the quality of life increased by .39 units when care increased by one unit. With regards to the moderating effect of adolescent disclosure (t = -3.91, β = -.04, p < .001) and paternal solicitation (t = -3.63, β = -.05, p < .001), they both reduced the effect that paternal knowledge exercised over quality of life.

Discussion

The aim of this study was twofold: to analyse the relationships, in the case of the father and the mother, between parental knowledge and substance use (tobacco, alcohol and cannabis), and parental knowledge and health-related quality of life, and to examine how these relationships were moderated by parental care and the sources of parental knowledge considered in this study: adolescent disclosure, parental solicitation, non-communication and bidirectional communication.

Nevertheless, the predicted moderating relationships were not obtained, as only a few interactions were significant, even when interactions were significant, they only led to slight increases in the model's effect size. However, despite the scarce existence of moderating relationships, parental care and the sources of parental knowledge exercised their effect, independently of parental knowledge, on the variables of substance use and quality of life.

Following the works of Stattin and Kerr (2000); Kerr and Stattin, (2000) and after verifying that the HBSC study questionnaire did not evaluate monitoring but rather knowledge, parental knowledge was labelled like that. From this perspective parental knowledge is considered the result of previous parents' behaviors (monitoring) but also of adolescents' ones (disclosure) (Smetana, Campione-Barr, & Metzger, 2006).

Substance use is one of the areas in which the relationship between parental monitoring and behavioral problems in the adolescents has been considered (Dishion & McMahon, 1998). It does appear that parental monitoring and knowledge are two key factors that influence and, in turn, prevent substance use, amongst other behavioral problems (Bray, Adams, Getz, & Stovall, 2001; Chilcoat & Anthony, 1996; Graber et al., 2006; Steinberg et al., 1994). In fact, a large number of studies have shown that adolescents who perceive a greater parental knowledge about their experiences, leisure-time activities, etc., are less likely to get involved in consumption behaviors (Li, Feigelman, & Stanton, 2000; Li, Stanton, & Feigelman, 2000; Rai et al., 2003; Richards, Miller, O'Donnell, Wasserman, & Colder, 2004).

The results of this study indicated that perceived maternal and paternal knowledge were negatively associated with substance use: tobacco, alcohol and cannabis, with maternal knowledge having greater influence. In addition, perceived parental knowledge had, in most cases, greater importance in the prediction of consumption than the adolescents' gender. Therefore, perceived parental knowledge was, along with age, the most relevant variable in substance use. This is a very important result since parental knowledge is a variable that can be modified and promoted in intervention policies aimed at the prevention of adolescent substances use.

Moreover, parental knowledge is especially important during adolescence because this is a stage in which, as has been said, the direct supervision of their parents is reduced, girls and boys tend to spend more time in other contexts and, for various reasons, the risk of them being involved in non-healthy behaviors such as substance use, increases (Jacobson & Crockett, 2000).

In the case of perceived parental care, its effect on substance use was very low, perhaps because, although it was found that an affectionate family atmosphere leads to less substance use (Buelga, Ravenna, Musitu, & Lila, 2006; Parra & Oliva, 2006), this is not as important as it would be for the quality of life, as will be commented below.

With regards to the sources of parental knowledge, both in the case of the father and the mother, the bidirectional communication source predicted lower tobacco, alcohol and cannabis use, while the non-communication source carried with it greater consumption of these three substances. As for adolescent disclosure, this source was the most similar to bidirectional communication in the prediction of the consumption of the three substances analyzed.

The results of this work also show that the truly relevant source in the prediction of a lower substance use was bidirectional communication, which implies that both the adolescents and their parents have an active role in this aspect, increasing the positive and beneficial influences that parental solicitation and adolescent disclosure each have independently. Similar results were found, for example, in the study by Barnett and Gareis (2007), in which adolescents who disclosed and with parents who knew about their activities were more inclined to demonstrate less risk behavior.

On the other hand, very little has been studied about health-related quality of life and its associations to parental monitoring and parental knowledge, except when wellbeing and behavioral problems have been examined together. This may be put down to the fact that although parental knowledge has a positive influence on a better quality of life (Fröjd et al., 2007; Graber et al., 2006; Jacobson & Crockett, 2000), it would appear that parental knowledge is more related to behavioral problems than to emotional ones, which depend more upon parental care and family communication (Bray et al., 2001).

Therefore, in the prediction of health-related quality of life, the results of this work show that perceived parental care, whether maternal or paternal, has greater influence

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than parental knowledge. In addition, when care moderates the relationship between knowledge and quality of life, it strengthens the effect that greater knowledge has over a better quality of life, above all when care is high. This moderating effect may be due to the fact that if care is involved in the parent-child relationships, it increases the probability that girls and boys accept the influence of their fathers and mothers on their development (Steinberg & Silk, 2002), promoting, in this case, a better quality of life.

With regard to the sources of parental knowledge, their principal effects were relevant on the prediction of the quality of life, indicating that the non-communication source tended to associate with lower levels, while the bidirectional communication source led to a better health-related quality of life. Therefore this source, which jointly considers the active role of the parents (with their interest in the experiences of their children) and adolescents (by disclosure), appears to be the most relevant in the development of parental knowledge, as well as in the quality of life. Again, the combination of an active role of parents and adolescents seems to multiply their positive effects on quality of life, leading to a better development.

Finally, with regards to substance use, as well as in health-related quality of life, maternal variables had greater influence than paternal ones, although the tendencies of both were similar. This fact may be due to the differences in how their work experiences affect the father and the mother in their family life, given that, as has been found in other studies (Bumpus, Crouter, & McHale, 2006), it appears that in the case of mothers, it is less likely for a labour event or situation to have a negative effect on their family tasks. This is something which could be extended to any other event that occurs outside of the family context. Although these phenomena were not analysed in this study, it would be interesting to know how other variables outside the family could affect fathers and mothers' implication in family life and, specifically, their parental knowledge about their children's experiences.

Amongst the limitations of this study, it is worth highlighting the following aspects. The first refers to the use of a single source of information -in this case the adolescent- which could generate a bias by magnifying the correlations between the assorted variables considered. Although confirming the information with the parents would enable the study to have more complete information about the relationships under study, it appears that the adolescent is a fairly reliable and objective source, even more so than the parents, who are more influenced by social desirability (Parra & Oliva, 2006). Moreover, despite not being able to take into account the information from fathers and mothers, the questions referring to the adolescent perception of them are examined separately.

Another limitation is the low variance explained of the regression analysis. This may be due to the fact that within an ecologic-systemic perspective that takes into account multiple contexts of influence, substance use and quality of life are predictable from a variety of factors, not only family ones. Thus, in the future, this work could be extended with the addition of other variables, not only from the family context but also referring to other contexts, such as peers. A final limitation is due to the cross-sectional design of this research, which has a more limited legitimacy than a longitudinal design, given that it hinders the direct examination of the start of a specific behavior and the determination of how much time a specific status lasts. Likewise, it confuses the causes with the effects, making it impossible to establish causal relationships or to conclude about the direction of the relationships between the variables.

Nevertheless, despite these limitations, this study offers relevant information to analyse the factors that bear influence on adolescents' substance use and quality of life, underlining the importance of parental knowledge, the sources of parental knowledge based on strategies in which parents and adolescents participate, and of parental care on adolescent adjustment.

Family studies like this one could be useful to promote and design intervention strategies for parents, as well as prevention training programmes, that start during childhood in an effort to reduce, eliminate or avoid current and future problems that affect parents and children during adolescence. In this way, the likelihood of a healthy development and the wellbeing of the entire family would be increased. The former idea is supported by studies as the HBSC, which strives to obtain a new internal view and a better understanding of general health and of the social context of the young people with the objective of acting at this stage

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