

Family resources and health behaviours in adolescence

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Abstract Previous research has documented the effects of family factors on children health behaviours: the family is, indeed, one of the primary environment underlying children's growth and development. In this paper, from one hand we examine if the family structure affects adolescent health behaviours in Italy in the same way it was found in studies focusing on US and Northern European countries; from the other hand, we analyse if the associations between family structure and adolescent health behaviours are determined by other factors such as parental behaviours, household economic well-being, and children satisfaction on family relationships. Four health behaviours of adolescents aged 14-17 are considered: two of them are risky behaviours (cigarette smoking and alcohol use), the other two ones regard healthy lifestyle behaviours (physical activity and optimal diet).

Key words: adolescents, family, health behaviours

1 Introduction

Previous research has documented the effects of family factors on children health behaviours. In particular, the focus on health behaviours of adolescents is motivated by several reasons. First, they are risk factors for many chronic illnesses later in life and thus they can be considered as precursors to disease. Second, risky health behaviours, such as cigarette smoking and alcohol abuse, are often initiated during adolescence (Green and Palfrey, 2000) and continue into adulthood (Jefferis *et al.*, 2003). A similar

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remark holds for health lifestyle (Telama *et al.*, 2005): sedentary behaviour and dietary habits developed during adolescence may form the basis for adult habits.

Thus, it is important to determine what factors during adolescence affect minors' health lifestyles and, clearly, the role of the family in the development of the different behaviours is crucial being the family one of the primary environment underlying children's growth and development.

In this paper, we will examine the effects of family characteristics on four health behaviours of adolescents aged 14-17. Two of them are risky behaviours and are connected with substance use: cigarette smoking and alcohol use; the other two ones regard healthy lifestyle behaviours: physical activity and optimal diet.

The aim of the paper is to give an answer to the following questions:

- 1 how does the family affect adolescent health behaviours in Italy compared to what was found in studies focusing on US and Northern European countries?
- 2 To what extent the associations between family structure and adolescent health behaviours are determined by other factors such as parental behaviours, household economic well-being and family satisfaction?

The present study explores the effects of several factors on adolescents' health behaviours, using data from an Italian nationally representative survey.

2 Previous research

There is no doubt in the negative effects of adolescent smoking and alcohol consumption, but also the relationship between physical activity and various aspects of health are well established: active lifestyles are often associated with better health status and quality of life among children. Similarly, a large body of evidence suggests that the daily consumption of vegetables and fruits helps to promote health and to prevent chronic disease.

The role of the family in the development of these different behaviours is considered crucial. In particular, due to the increase in the percentages of children living in non-traditional families, such as single-parent families and step-families, increasing studies examined the consequences for living in these household types on health behaviours. It has been argued that young people in lone-parent households or stepfamilies may be disadvantaged with respect to those in intact families and this disadvantage may lead to negative or lower "outcomes" in later life. However, it is not clear whether these disadvantages are the effect of the poorer socio-economic circumstances of lone-parent families and stepfamilies compared to intact families or a direct result of family structure. In addition, other key familial factors such as the health behaviours of parents, and family satisfaction (as a proxy of family functioning) may mediate the effect of family structure on adolescents' outcomes.

While several studies have investigated the relationship between health related behaviours and family structure (see, for example, Blum *et al.*, 2000, Duncan *et al.*, 2002, McLanahan, 2009, Stewart and Menning, 2009) or socio-economic status (SES) (for a review, see Hanson and Chen, 2007), very few researches have considered both family structure and socio-economic status, focusing on the potential indirect effects which can pass through parental behaviours (Griesbach *et al.* 2003).

In particular, as regards the family structure, for instance, it has been shown that children from two-parent families had lower substance use (Blum *et al.*, 2000; Duncan *et al.*, 2002) and lower attitude for smoking (e.g. Griesbach *et al.*, 2003). In addition, adolescents in single-parent families are more likely to have unhealthy eating habits (Stewart and Menning, 2009). Literature on the effects of family resources showed that low SES adolescents were at greater risk for cigarette smoking and reported poorer nutritional habits and less exercise than high SES teens. But parents may influence their children behaviours also by means of their own behaviours, which can be emulated by their children. Lastly, it should be noted that the effect of family structure can be mediated by what is commonly referred to as “family functioning”, i.e. the quality of interactions between family members. It has been shown, for example, that children psychological well-being is associated with family functioning (see, for instance, Shek, 1997). So, if possible, this is a factor that should be also controlled for.

3 Data and methods

3.1 Data and measures

We use data from survey “Aspects of Daily Life”, conducted in Italy in 2005 by the National Statistical Institute (ISTAT), and based on a representative sample at national level of about 20,000 households. In this survey several items on health, lifestyle and social behaviours for each household member (aged more than 11) are recorded. In addition, information on the socio-economic status of the family, on the family structure and on satisfaction on family relationships is available.

Smoking status

Current smoking behaviour was assessed by the question “Do you smoke now?” with the three response alternatives: “yes”, “I smoked in the past”, “I never smoked”. Initially, adolescent’s smoking status was defined through three categories – smokers, ex-smokers and non-smokers. In all subsequent analyses, never-smokers were compared to ever-smokers.

Alcohol use

Drinking behaviour was investigated by various questions aimed to assess lifetime, last 12 months, and current use of wine, beer, and spirits. In addition, it is also recorded whether the respondents have experienced “binge drinking” or not. This is measured by a question which asks whether during the past 12 months, the interviewee has happened to have 6 or more alcoholic drinks in a row.

Adolescents’ risky behaviour connected with alcohol use was measured by a dichotomous variable distinguishing young children who had happened to experience binge drinking or not.

Physical activity

The survey also provides separate items for playing sports and having some physical activity. In our analysis, we construct a categorical variable distinguishing individuals who play sport continually, those playing sport only occasionally, those who have some physical activities and sedentary individuals.

Optimal diet

Optimal diet is defined considering the daily consumption of fruits and of vegetables. Respondents are asked on frequency with which they eat several food items, among which vegetables and fruits. Respondents indicated how many days they usually consumed different foods. The five response categories were “not at all”, “less than once a week”, “some times a week”, “once a day”, “more than once a day”. A dichotomous variable defined daily consumers of vegetables or fruits as those who answered that they ate vegetables or fruits at least once a day.

Family structure

Family structure was defined on the basis of the family ties between young children and adult in the household. In this way, four categories of families were distinguished:

- Intact families: adolescents lived with their father and their mother;
- Lone-parent families: adolescents lived with either their father or their mother, but not both (and they did not live with a step-parent);
- Stepfamilies: adolescents lived with their father and his partner, or with their mother and her partner;
- Non-parental families: adolescents did not live with their father, mother, or a step-parent.

Since less than 1% (7 observations, corresponding to 0.3%) of adolescents aged 14-17 of our sample lived in non-parental families, these cases were removed from the following analyses as no meaningful analyses could be carried out on such small group.

Family socio-economic status

Several questions of the survey can be used as a measure of the family's socio-economic status. Families are asked about the quality of the area they live in, the quality of their house and the durable goods they have. Three different indices of economic status are used: the first one considers items on the quality of the area in which the family lives, the second is referred to the quality of the house in which the family lives and the last index uses items on possession of durable goods. These indicators are built as a weighted average of items where the weights are inversely proportional to the coefficient of variation of each item. In this way, considering, for example, the last indicator on durable goods, we give a greater weight to goods that are owned by a large fraction of families and a lower weight to goods that are owned by a small fraction of families.

Parental behaviours

In order to take into account the possible influence of parental behaviour, health behaviours of fathers and mothers are considered. In particular, for each health behaviour of the adolescents, their parental counterpart behaviours are considered.

For parental smoking status, families are distinguished in two groups as having no smoking parents or having one or more smoking parents; a similar categorization is used to identify parents who were ex-smokers.

Parental alcohol use is considered through the daily consumption of wine and beer. In particular, excessive drinkers are defined as men consuming more than 3 units (2 for women) per day. Children with no excessive drinkers parents are distinguished from those whose at least one parent is an excessive drinker.

As regards physical activity, parents who do not play sport either continuatively or only occasionally and who do not have some physical activities are defined as sedentary; in this way, families are distinguished according to whether or not they have at least one sedentary parent.

Finally, parental diet behaviour is measured by the daily consumption of fruits and of vegetables. Parents who are daily consumers of vegetables or fruits are distinguished from those who answered that they did not eat vegetables or fruits at least once a day: families are grouped in two groups as having no parents who are daily consumers of vegetables or fruits or having one or more parents with this good diet habit.

Family functioning

Family functioning is defined as the set and the quality of interactions between family members. We do not have an accurate measure of family functioning but a question asking to children to evaluate their satisfaction on family relationships can be taken as a proxy of this aspect.

3.2 Descriptive analyses

Table 1 reports the percentages of different health behaviours among adolescents aged 14-17 broken down by adolescents' family structure, with findings in line with what have been showed by previous literature (despite the small sample size of adolescents living in stepfamilies). Adolescents in non-traditional families are more likely to smoke than others. Binge drinking measurement suffers from missing data and missingness varies across family structures. Sport and physical activity are more common among adolescents living with both biological parents, even if the percentage of sedentary adolescents is higher for them than for adolescents living in stepfamilies. The daily consumption of fruits and vegetables is lower among adolescents living in non-traditional families.

3.3 Multivariate analyses

We want to see to what extent these results of associations between family structure and adolescent health behaviour are independent of other factors such as family satisfaction, parental behaviours and material resources. In order to assess whether there was an independent effect of family structure on adolescents' health behaviours, separate multivariate analyses were carried out for each adolescents' health behaviours. In these analyses each health behaviour variable entered as dependent variable and the other variables – family structure, gender, family satisfaction, family socio-economic status and parental behaviours – are considered as covariates.

In particular, the dependent dichotomous variables (smoking status, binge-drinking, and daily vegetables or fruits consumption) are analysed through logistic regression models, whereas the physical activity is described by a ordered logit model.

Table 1: Health behaviours among adolescents aged 14-17 according to their family structure.

<i>Family structure</i> <i>Health behaviours</i>	<i>Both</i> <i>biological</i> <i>parents</i>	<i>Step-</i> <i>families</i>	<i>Single-</i> <i>parent</i>	<i>Total</i>
<i>Current smoking behaviour</i>				
Missing	1.5	4.2	1.8	1.6
Yes	6.5	8.3	12.6	7.2
I smoked in the past	3.3	8.3	3.6	3.3
I never smoked	88.7	79.2	82.0	87.9
<i>Binge drinking</i>				
Missing	3.1	8.3	3.2	3.1
No	89.4	87.5	88.3	89.3
Yes	7.5	4.2	8.5	7.6
<i>Sport and physical activity</i>				
Missing	3.0	0.0	2.7	2.9
Continuatively	47.4	29.2	44.6	46.9
Only occasionally	14.4	25.0	12.1	14.3
Physical activity sometimes	19.7	37.5	22.1	20.1
Sedentary	15.5	8.3	18.5	15.8
<i>Daily consumption of fruits and vegetables</i>				
Missing	0.9	0.0	3.2	1.1
Neither fruits nor vegetables	21.7	33.3	29.7	22.7
Yes, daily consumption of fruits or of vegetables	77.4	66.7	67.1	76.2
<i>Total = 100</i>	1,872	24	222	2,118

4 Results

Table 2 lists the coefficients related to the models describing adolescents' health behaviours.

Parental behaviours appear to have a strong effect on those of children, and also the socio-economic status and the family satisfaction have strong effects; whereas the effect of family structure is weaker and still significant only for optimal diet: there is a positive effect of single-parenthood on the probability of being no daily consumers of vegetables and fruit, but no significant effects have been found for other behaviours. We should keep in mind that step-families are very few, so this result may depend on this.

Table 2: Factors influencing adolescents' health behaviours according to logistic and ordered logistic models.

	Dependent variable			
	<i>Smoker or ex- smoker</i>	<i>Binge- drinking</i>	<i>Sedentary</i>	<i>No daily vegetable and fruits consum- ption</i>
Gender (reference: female)				
Male	0.43***	0.95***	-0.74***	0.28**
Age (ref: 16-17)				
14-15	-0.98***	-1.02***	-0.21**	-0.08
Region of residence (ref: South)				
North	0.70***	1.29***	-0.18	-0.03
Centre	0.34	0.48	-0.12	0.09
Siblings (ref: No)				
1 sibling	-0.16	0.38	0.10	-0.22
2 or more siblings	0.11	0.25	0.49***	-0.28
Family satisfaction (ref: No)				
Yes	-1.07***	-0.91***	-0.18	-0.38
Family structure (ref: both parents)				
Stepfamilies	0.47	-0.94	0.51	0.64
Single-parent	0.33	-0.62	0.18	0.49***
Quality of the area of residence				
	0.75	0.18	-0.35	0.01
Quality of the house				
	-1.38	0.42	-0.96	0.89
Durable goods				
	-3.07**	1.39	-6.29***	0.55
Parental smoking				
(ref: no smoking parent(s))				
One or both parents smoke	0.61***			
One or both parents ex-smokers	0.52***			
Parental alcohol consumption				
(ref: no excessive drinkers parent(s))				
One or both parents are excessive drinkers		0.76***		
Parental physical activity (ref: No sedentary parent(s))				
One or both parents sedentary			0.67***	
Parental vegetables and fruits consumption				
(ref: No daily consumers parent(s))				
One or both parents are daily consumers				-1.51***

** = $p < .05$, *** = $p < .01$

5 Further research

From a first analysis, it appears that missing values is likely to be an issue for our analysis especially when considering binge-drinking and smoking, for which it seems hardly plausible to assume that missing occurs at random. In these cases the missing value mechanism is referred to as *non ignorable* (Little and Rubin 2002). The most commonly used method to deal with non ignorable missing data is the EM (Expectation and Maximization) algorithm: Ibrahim and Lipsitz (1996) proposed an EM algorithm to estimate the coefficients of a binary regression when the response is missing and Ibrahim *et al.* (1999) proposed a similar method to estimate the parameters of a generalized linear model with missing covariates.

In essence, we will define a complete-data model in which the joint distribution of the response variable y and the missing data indicator m will be specified as the product of the conditional distributions $f(y|x, \beta)$ and $f(m|z, \alpha)$. The maximum likelihood estimates of α and β will be obtained by maximizing the expected likelihood, where the expectation is taken over the missing data.

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