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ORIGINAL PAPER

Three-generation households and child mental health in European countries

Viviane Kovess Masfety[1] · Carlijn Aarnink[2] · Roy Otten[2] · Adina Bitfoi[3] · Zlatka Mihova[4] · Sigita Lesinskiene[5] · Mauro Giovanni Carta[6] · Dietmar Goelitz[7] · Mathilde Husky[8]

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Abstract

Purpose To evaluate the associations between the presence of a grand parent at home that is three-generation household, with children mental health in diverse countries whether this situation is frequent or not.

Methods Data from the School Children Mental Health in Europe cross-sectional survey in six countries ($n=4582$) were used to examine the association between three-generation households and child mental health across Europe. The parent and teacher Strengths and Difficulties Questionnaire was combined to assess child mental clinical problems.

Results Overall, 25.13% of European families live with at least one grandparent: 5.46% in Western and 29.70% in Eastern Europe. Controlling for key sociodemographic variables and for country of residence, the presence of a grandparent is associated with an increased risk for child mental health problems in the total sample (OR 1.37, $p=0.002$). In two-parent homes, the effect of the presence of a grandparent is significant (OR 1.40, $p=0.026$), while it is not in single-parent homes. In each country, the presence of a grandparent is a risk for either externalizing or internalizing problems.

Conclusions Programs may be developed to educate elderly people to better respect their children's role as parents so having a grandparent in the home can become an asset for family members rather than a burden.

Keywords Child mental health · Family · European countries · Grandparents

Introduction

According to the 2017 census, 10.40% of US children (0–18) live in three-generation households that generally include a grandchild, the child's parent(s), and one or more grandparents in the same home. The percentage of three-generation households varies across ethnicity: 7% of Caucasian, 14% of African-American, 13% of Hispanic, and 15% of Asian children. Five percent of children who live with married parents also live with a grandparent, compared to 17% of those who live with a single mother [1]. These living arrangements are even more frequent in early childhood: in the US, close to one in four children of two-parent homes live in a three-generation household, compared to 8% of such children in the UK and 11% in Australia [2]. Younger, less educated and minority mothers with lower income are more likely to live in three-generation households in all three countries [2]. In the Survey of Health, Ageing and Retirement in Europe [3] based on approximately 50,000 respondents from 17 European countries, the likelihood of having a grandparent in the home varies considerably between countries. In Sweden,

✉ Viviane Kovess Masfety
vkovess@gmail.com

1 Ecole des Hautes Etudes en Santé Publique, EA 4057 Université Paris Descartes, Paris, France

2 Radboud University Nijmegen, Nijmegen, The Netherlands

3 The Romanian League for Mental Health, Bucharest, Romania

4 New Bulgarian University, Sofia, Bulgaria

5 Clinic of Psychiatry, Faculty of Medicine, University of Vilnius, Vilnius, Lithuania

6 Psychiatric Unit, Department of Public Health, University of Cagliari, Cagliari, Italy

7 University of Erlangen-Nuremberg, Erlangen, Germany

8 Institut Universitaire de France, Université de Bordeaux, Bordeaux, France

16% of the elderly respondents reported living with an adult child, whereas it was significantly more common in Eastern countries such as Poland (66%) or in Southern European countries like Italy, Greece, and Spain. Overall, in Eastern and Southern Europe, a higher proportion of three-generation households are observed as compared to Northern and Western Europe.

Another study used welfare data in three US cities, which allowed for the identification of the role of ethnic differences with regard to family structure. The study first showed that mothers living in low-income three-generation households reported higher levels of internalizing problems in their child as compared to mothers of children living in low-income non-multigenerational households. In addition, mothers living in a three-generation household are often younger than those in two-generation household. In three-generation homes, only the oldest mothers seem to benefit from the presence of other family members in the home in that children in these families do not seem to be at greater risk for mental health problems. It was observed that older mothers have more effective parenting as compared to the younger mothers who may stay with their mothers, because they are less mature. Interestingly, this effect was observed in Caucasian and Latino families but not in African-American families [4].

The presence of a grandparent in the child's home raises important sociological and psychological issues such as whether it is beneficial for grandchildren. It has been suggested that multigenerational bonds can enhance or replace the functions of the traditional family by providing affection and a sense of protection and belonging, in particular when there is marital instability or a divorce in progress [5]. In addition, in-home grandparents may also support parents by taking care of their children [6], and reversely, the presence of grandchildren has been reported to have a positive effect of the mental health of the elderly [7].

In a study of African-American families with children aged 4–17, children living with their mother alone displayed more conduct problems than children living in nuclear families, or children living with their mother and grandmother or their mother and another family member [8]. Similar findings were reported in an economically disadvantaged urban community where single-mother families were at the highest risk for child psychological problems and where the presence of a second adult such as in mother–grandmother families was nearly as effective as mother–father families with regard to that risk [9].

Thus, it appears that the presence of a grandparent in the home could either have positive or negative effects on child mental health depending on the mother's age and marital status (single or living with a significant other). It also appears that these effects could vary across cultures [1]. Since there has been limited research conducted on the effects on three-generation families on child mental health in Europe where the context is very different from the US where most of the research on this topic originated from, we propose a study based on a sample of contrasted countries including Eastern countries: Bulgaria, Romania, East Germany, and Lithuania and Turkey, and two Western European countries: Italy and West Germany where the percentage of three-generation families is expected to differ.

Aims of the study

The objectives of the study are (1) to examine the frequency and characteristics of families with and without a grandparent in the home, (2) to determine whether the presence of a grandparent is associated with child mental health, controlling for other factors including single-parent status, maternal activity status, age, and country, and (3) to examine the effect of country of residence.

Materials and methods

Sample

The sample was drawn from the cross-sectional School Children Mental Health in Europe (SCMHE) study, conducted in 2010 in seven European countries. The Netherlands was not included in the analyses, because less than 1% of households comprised a grandparent.

The current study then included 5245 families who provided information about household composition of which 4582 provided child mental health assessments from two informants: parents and teachers. The children's age ranged from 6 to 12 years, with a mean age of 8.69 years (SD 0.016). Boys and girls were fairly equally represented (51% boys and 49% girls).

Procedure

Approximately 45–50 elementary schools were approached per country; a greater number of schools were approached in Germany. Then, 48 children were randomly selected in each school. Among participating schools, between 50.5% (Turkey) and 67.5% (Romania) selected children participated. Detailed information on sampling methods has been published elsewhere [10]. Parents and teachers completed the Strength and Difficulties Questionnaire to assess child mental health problems. In addition, sociodemographic variables and family characteristics were informed by the parents.

Ethics statement

All countries obtained approval of their relevant ethical committees which reviewed the process: Parents received an information letter and a consent form to be signed and returned to the school if they did not want their child to participate. All participating countries had the support of their government, including their ministers of education and health, and received ethical approval from relevant authorities. Specific procedures were used in Germany and Turkey where such committees operate differently. In addition, each country provided authorizations from school authorities. In Bulgaria: The Deputy Minister of Education, Youth and Science of the Republic of Bulgaria; in Germany, approval was obtained through landers: (a) Ministry of Education, Science and Culture, Mecklenburg-Vorpommern, (b) State school authority, Luneburg, and (c) Ministry of Education and Culture of Schleswig-Holstein country; in Lithuania: the Ministry of Education and Science of the Republic of Lithuania; in The Netherlands: the Commission of Faculty Ethical Behavior Research; in Romania, the Bucharest School Inspectorate General Municipal; in Turkey: the Istanbul Directorate of National Education; in Italy: the ethical committee of the Association of European Mediterranean University plus each school board. Data were anonymized for analysis.

Assessments

Sociodemographic characteristics

The sociodemographic variables collected included household composition, the presence of grandparent, maternal employment, gender of the child, age of the child, maternal age, and marital status. The variable 'maternal employment' was divided into two categories: (1) active and (2) inactive (which corresponds to student, homemaker, or unemployed). Age of the mother at child birth was divided into four categories: (1) ≤ 25, (2) 25 to < 30, (3) 30–40 years, and (4) > 40 years, and maternal education into three categories: less than high school, graduated high school, some college, or more.

In addition to sociodemographic variables, maternal psychological distress was measured using a subscale of the SF-36. The SF-36 contains 36 items about well-being and functioning [10].

Child mental health

Both parent and teacher versions of the Strengths and Difficulties Questionnaire (SDQ) were used. The SDQ is a brief questionnaire that measures the psychological adjustment of children and youths [11]. The SDQ consists of 25 items divided into five subscales; emotional problems, conduct problems, hyperactivity-inattention problems, peer-relationship problems, and prosocial behavior. The answers are reported on three-point Likert scales scored with 0 ("not true"), 1 ("somewhat true"), and 2 ("certainly true") [12]. Goodman's algorithms were used [13] to identify children with mental health problems. These algorithms combine parent and the teacher SDQ items to create four variables: 'conduct problems', 'hyperactivity', 'emotional problems', and 'any psychiatric problem' for the presence of any of them. Each variable is divided in three categories, which give an indication of whether the mental health problem is (1) unlikely, (2) possible, or (3) probable. In the current study, unlikely and possible were combined and compared to probable mental health problem. This algorithm has proven to be highly predictive of clinical diagnoses of child mental health problems [14].

Parenting style

A total of five dimensions of parenting styles were queried: caring (hugging, complimenting, and enjoying the child) and autonomy (allowing child to choose clothes, travel alone, and choose friends) were drawn from the Parent Behaviors and Attitudes Questionnaire [15]. In addition, over-reactivity (responding in an emotionally charged, harsh manner), verbosity (frequently using verbal means to respond to misbehavior), and laxness were drawn from the 30-item Parenting Scale, for each country except Italy [16]. Each item was rated on a seven-point scale, summed, and cut-points were based on being more than one standard deviation above the mean of the total sample of countries.

Statistical analyses

All analyses were performed using Stata 13.1. A Chi-square test was conducted to investigate whether there was a significant relationship between household composition and child mental health. Second, a Chi-square test was conducted for the association between other variables and child mental health. Next, a logistic regression analysis was conducted to determine whether household composition was associated with child mental health. Logistic regressions were adjusted for maternal age, parental distress, gender, and maternal activity status as these variables were associated with child mental health and country of residence. Finally, similar analyses were done for each country. An alpha level of 0.05 was used for all statistical analyses.

Results

Household composition

As shown in Table 1, 25.13% of European families live with at least one grandparent. However, these percentages vary

greatly with contrasted situations regarding Romania and Bulgaria (40%), and Lithuania (23%) compared to 6 or 7% in Germany, Italy, or Turkey.

Overall, 13.80% of the sample lives with one grandparent only, 10.94% with two grandparents, 0.29% with three, and 0.10% with four grandparents. In addition, 63.78% of the participants live in a two-parent home without grandparents, 20.7% live in a two-parent home with at least one grandparent, 8.51% live in a single-parent home without grandparents, and 7.04% live in a single-parent home with at least one grandparent with large differences between countries.

The two-grandparent homes are located mainly in Bulgaria (20.07% of the sample) and in Romania, followed by Lithuania (7.27%). As expected, 92.33% of grandparents are grandmothers and only 7.67% are grandfathers with no significant between-country differences in grandparent gender. Grandparent age ranges from 48 to 93 years with a mean age of 64.96 years (SD 8.67): 53.63% were 48 and 64 years, 39.76% between 65 and 79, and 6.61% were 80 or older. The percentage of grand parents 80 or older varied across countries: 12.24% in Italy and 11.51% in Lithuania, 3.8% in Bulgaria, 5% in Germany, 5.68% in Romania, and 8.70% in Turkey. There was a significant difference in mean grandparent age across countries ($p=0.029$). Finally, 29.76% of three-generation families are living in rural areas, and 22.17% in urban areas are mostly in large cities 20.77%.

Factors associated with the presence of a grandparent in the home in univariate analyses

The presence of a grandparent living at home is associated in univariate analyses with several demographic factors such as single-parent homes (OR 2.31), younger maternal age: below or equal to 25 years, medium levels of maternal education as compared to those with some college or more (OR 1.42), while the presence of more than one child at home decreases the probability (OR 0.54 for 2 or 3 children; OR 0.27 for 4 or more), as does an inactive mother (OR 0.64). The presence of a grandparent is associated with more caring (less low caring) and more laxness but not with the other parental attitudes (Table 2). Grandparent age group (64 or younger, 65–79, 80, or older) was not significantly associated with any of the diagnostic categories.

Factors associated with the presence of child mental health problems

In multivariate analyses controlling for sociodemographic characteristics associated with the presence of a grandparent in the home and for country of residence, the presence of a grandparent is associated with an increased risk for any child mental health problem in the total sample (OR 1.37, $p=0.02$) (Table 3).

As expected, boys have more mental health problems than do girls (OR 2.40), single-parent families (OR 1.52), and mothers with psychological distress (OR 2.44), or with medium levels of education and low caring are associated with child mental health problems.

The presence of a grandparent is strongly associated with ADHD (OR 2.30) together with higher risk for boys and parental psychological distress.

Factors associated with emotional problems are slightly different. Emotional problems are associated with inactive mother status and parental psychological distress,

Table 1 Household composition and mental health problems by country

	Italy		Germany		Bulgaria		Lithuania		Romania		Turkey		Total		Chi-square
	$n=756$		$n=468$		$n=1076$		$n=1114$		$n=1186$		$n=645$		$n=5245$		p
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Presence of a grandparent in the household															
No	707	93.52	220	93.62	658	61.15	862	77.38	653	55.06	599	92.87	3927	74.87	**0.000**
Yes	49	**6.48**	20	**4.27**	418	**38.85**	252	**22.62**	533	**44.94**	46	**7.13**	1318	**25.13**	
Household composition															
2 parents 0 GP	624	87.52	322	74.19	577	54.03	667	57.95	581	49.15	564	84.30	**3335**	**63.78**	**0.000**
2 parents = > 1GP	36	5.05	16	3.69	327	30.62	191	16.59	455	38.49	50	7.47	**1081**	**20.67**	
1 Parent 0 GP	44	6.17	92	21.20	56	5.24	176	15.29	51	4.31	26	3.89	**445**	**8.51**	
1 parent = > 1 GP	9	1.26	4	0.92	108	10.11	117	10.17	95	8.04	29	4.33	**368**	**7.04**	
Any MH problems	59	7.79	95	11.95	146	11.33	195	15.70	145	11.67	87	10.81	727	11.86	**0.000**
ADHD		2.25		1.26		1.01		3.06		0.81		1.37	99	1.62	**0.000**
Conduct problem		5.81		8.95		8.46		11.68		8.30		6.55	524	8.57	**0.000**
Emotional problem		1.72		2.77		2.56		3.46		3.55		3.65	184	3.01	**0.000**

Bold values indicate statistically significant odds ratios

Table 2 Presence of a grandparent living in the household and associated factors (mono variate)

	Presence of a grandparent living in the household				
	No	Yes	OR	95% CI	
	$n=4651$	$n=1320$		Lower	Upper
Number of children in the household					
Only child	65.90	34.10	Ref		
2–3 children	78.28	21.72	**0.54**	0.47	0.61
4 or more children	87.81	12.19	**0.27**	0.18	0.39
Parental marital situation					
Single-parent home/two-parent home	11.77	23.56	**2.31**	1.96	2.72
Maternal employment status					
Inactive (including unemployed)/active	37.20	27.46	**0.64**	0.55	0.74
Maternal psychological distress					
Presence/absence	17.82	18.03	1.01	0.86	1.20
Maternal age at birth of the child					
≤ 25 years	28.24	45.37	Ref		
> 25–30	25.44	23.98	**0.59**	0.50	0.69
> 30–40	28.39	15.48	**0.34**	0.28	0.41
> 40	17.93	15.17	**0.53**	0.44	0.63
Maternal education					
Some college or more	77.11	22.89	Ref		
High school graduate	70.27	29.73	**1.42**	**1.23**	**1.65**
Less than high school	79.37	20.63	0.88	0.71	1.08
Parental attitudes					
Low caring/medium or high	18.35	14.94	**0.78**	**0.65**	0.93
High laxness/medium or low[a]	16.05	20.75	**1.37**	**1.14**	**1.64**

Bold values indicate statistically significant odds ratios

[a]Excluding Italy

but do not reach significance with grandparents living at home, although there was in trend in that direction OR 1.51 ($p=0.079$). Conduct problem is not significantly associated with the presence of a grandparent (OR 1.25, $p=0.15$). The inclusion of grandparent age group did not have a significant effect on the latter analyses (tables available upon request).

The negative effect of grandparent presence on any child mental health diagnosis controlling for the same factors as above is very significant in two-parent homes: OR 1.40 (CI 1.04–1.83), while there is not such an effect in single-parent homes: OR 1.20 (CI 0.68–2.12) (tables available upon request).

Within-country analyses controlling for the same covariates were exploratory, since, in some of the countries, the samples were relatively small as were the number of grandparents or prevalence of some mental health problems. That being said, these analyses showed a differential but constant negative effect of grandparent presence on child mental health in each country. Concerning any mental health problem, Romania is the only country where the effect is significant OR 2.11 (CI 1.29–3.44); it is also the only country where grandparent presence is associated with conduct problem OR 1.99 (CI 1.12–3.53) (Table 4). However, the presence of a grandparent is associated with ADHD in Bulgaria OR 7.10 (CI 1.30–38.8), Lithuania OR 3.28 (CI 1.25–8.59), and Turkey OR 9.45 (CI 1.44–61.76). A grandparent living at home is also somewhat associated with emotional problems though not significantly in Romania OR 2.27 (CI 1.00–5.17, $p=0.057$) and significantly in Germany and Italy (Table 5).

Discussion

The purpose of this study was to examine the factors associated with the presence of a grandparent in the home, and its correlation with child mental health. In the present sample, the presence of a grandparent was found to be quite common in Eastern Europe countries, especially in Bulgaria and Romania, and to a lesser extend in Lithuania, and to be rare in the West, as previously reported [3, 7]. This could be due to the housing situation in these countries which has changed dramatically: after the 1989 political changes, the governments of these countries sold

Table 3 Factors associated with the presence of child mental health problems (multiple regression)

	Any mental health problem ($N=3692$)			ADHD ($N=3692$)			Emotional problems ($N=3688$)		
	AOR	95% CI		AOR	95% CI		AOR	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
Presence of a grandparent									
Yes/no	**1.37**	**1.05**	**1.77**	**2.30**	**1.27**	**4.17**	1.51	0.95	2.40
Parental marital situation									
Single-parent/two adults	**1.52**	**1.15**	**2.01**	1.43	0.77	2.65	1.35	0.80	2.26
Maternal employment status									
Inactive/active	1.13	0.88	1.45	1.08	0.61	1.89	**1.76**	**1.14**	**2.73**
Maternal education									
Some college or more									
High school graduate	**1.42**	**1.11**	**1.84**	**2.02**	**1.11**	**3.67**	0.96	0.60	1.53
Less than high school	1.35	0.92	1.99	1.50	0.58	3.83	0.96	0.50	1.86
Maternal age at birth									
< 25 years	Ref								
25–30 years	0.93	0.70	1.23	0.78	0.41	1.49	1.36	0.81	2.26
30–40	0.76	0.55	1.04	0.58	0.28	1.22	1.14	0.64	2.02
> 40 years	0.97	0.66	1.43	0.65	0.23	1.79	1.53	0.80	2.94
Child gender									
Boy/girl	**2.40**	**1.91**	**3.03**	**6.34**	**3.10**	**12.95**	1.06	0.72	1.57
Number of children in the household									
Only child									
2–3 children	1.09	0.84	1.40	1.14	0.62	2.07	1.03	0.65	1.62
4 or more children	1.45	0.88	2.38	1.11	0.33	3.70	1.33	0.56	3.14
Maternal psychological distress presence/absence	**2.44**	**1.91**	**3.12**	**4.15**	**2.45**	**7.05**	**2.85**	**1.87**	**4.36**
Low caring/high caring	**1.38**	**1.05**	**1.80**	1.05	0.56	1.96	0.96	0.58	1.58
Country									
Bulgaria	0.80	0.63	1.03	**0.49**	**0.26**	**0.93**	0.79	0.49	1.26
Germany	1.32	0.96	1.82	1.78	0.86	3.69	1.11	0.59	2.11
Italy	1.19	0.87	1.62	2.28	1.19	4.38	0.79	0.43	1.46
Lithuania	1.13	0.91	1.41	0.35	0.84	2.16	0.98	0.65	1.48
Romania	0.87	0.68	1.10	**0.34**	**0.17**	**0.69**	1.26	0.85	1.89
Turkey	0.81	0.59	1.12	1.09	0.54	2.17	1.17	0.70	1.94

AORs represent adjusted odds of child mental health problems controlling for all variables in the table. Bold signifies statistically significant odds ratios

state-owned houses to the citizens at very affordable prices [17]. As a consequence, adults who are currently grandparents obtained easy access to homeownership. Later on, as the economy grew the cost of housing increased exponentially and real-estate prices kept rising especially in cities until 2008 when prices dramatically dropped due to the recession. Recently, prices have increased, while the economy struggles to provide high salaries or employment to each citizen [18]. As a result, it has become generally a substantial financial burden to purchase a house for young adults, and it is usually the grandparents who own the house in three-generational households, which are relatively frequent. In addition, the higher divorce rates in these countries together with younger age of mothers as compared to the Western European countries [19] may have accentuated the need for help from the grandparents.

In the overall sample, the presence of a grandparent at home has a negative effect on child mental health controlling for most of the other risk factors associated with mental health problems. The negative association with mental health is observed for any mental health problem and ADHD, and there is a trend towards the same effect for emotional problems as evaluated by parents and teachers, and no significant effect for conduct problems. The negative association of the presence of at least one grandparent in the home is present in each country for at least one diagnosis:

Table 4 Predictors of child mental health problems in Romania (multivariate)

Romania ($N=832$)	Any mental health problem ($n=832$)			Conduct problems ($n=832$)		
	AOR	95% CI		AOR	95% CI	
Presence of a grandparent						
Yes/no	**2.11**	**1.29**	**3.44**	**1.99**	**1.12**	**3.53**
Maternal employment status						
Inactive/active	1.22	0.72	2.09	0.91	0.47	1.72
Maternal education						
Some college or more	Ref					
High school graduate	0.91	0.53	1.56	1.20	0.63	2.31
Less than high school	0.89	0.42	1.89	1.11	0.45	2.75
Maternal age at birth						
≤ 25 years	Ref					
25–30 years	0.73	0.40	1.33	0.83	0.41	1.68
30–40	0.69	0.34	1.40	0.74	0.32	1.71
> 40 years	1.18	0.57	2.46	1.28	0.54	3.0
Child gender						
Boy/girl	**1.71**	**1.06**	**2.76**	**2.67**	**1.46**	**4.87**
Number of children in the household						
Only child	Ref					
2–3 children	1.55	0.93	2.56	1.54	0.84	2.79
4 or more children	1.92	0.50	7.36	1.80	0.35	9.19
Maternal psychological distress						
Presence/absence	**2.73**	**1.56**	**4.76**	**2.14**	**1.09**	**4.18**
Low caring/medium or high caring	1.07	0.59	1.93	1.33	0.68	2.60
Single/two adults home	1.57	0.84	2.95	1.81	0.88	3.70

Bold values indicate statistically significant odds ratios

externalizing problems in Eastern Europe and Turkey and internalizing problems in Western Europe.

Any interpretation of the national data should be considered with caution due to the small sample sizes particularly in Germany and Italy: in these two countries, there were no cases with externalizing disorders for whom a grandparent lived in the household in contrast with the remaining countries where the risk of externalizing disorders increased with the presence of a grandparent living at home. On the other hand, internalizing disorders seemed to be associated with the presence of a grandparent at home in Western countries. These findings may reflect the context of three-generation families in the West where the situation may be a choice [7] as opposed to Eastern countries where it may be more often an obligation due to housing constraints. This could also reflect parental attitudes, which may be harsher in the Eastern regions than in the West [20]. Taken together, these findings may be parallel to what has been described on differential effects of three-generation household on children in different ethnic groups in the US [1].

Notably, the association between grandparent presence and child mental health differed whether in a single or two-parent home with negative effects only in the latter configuration. Concerning two-parent homes with or without grandparents, the findings are consistent with the findings of Pittman and Boswell [4, 6], reporting more problem behavior in children living in a three-generation household compared to children living in a two-generation household. However, the authors noted that this depended on household composition. Interestingly, we had expected that the presence of a grandparent in single-parent homes would be associated with more positive outcomes as described in the previous studies which reported that the presence of a grandparent compensated the single-parent hardship [20] and could, sometimes, be superior to the two-parent homes [21], though this was not the case in the present study. In our study, no differences in child mental health were found between living in a single-parent family and those living in a single-parent three-generation household. Regarding single mothers, the self-selection bias of electing to live with their parent has been raised [22], though this bias may apply to mothers who are not single, as well; indeed, it seems that those who reside with a grandparent may be the most challenged on many respects related to housing problems and financial hardship, and

Table 5 Factors associated with emotional problems in each country (multivariate)

	Romania ($N=832$)			Bulgaria ($N=744$)			Germany (E+W) ($N=169$)			Italy ($N=413$)			Lithuania ($N=822$)			Turkey ($N=416$)		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Presence of a grandparent																		
Yes/no	*2.27*	*1.00*	*5.17*	0.74	0.25	2.19	**8.46**	**1.23**	**58.00**	**9.79**	**1.21**	**79.40**	1.24	0.49	3.13	1.41	0.15	12.94
Maternal employment status																		
Inactive/active	2.19	0.92	5.21	1.00	0.30	3.29	2.07	0.34	12.66	4.54	0.94	21.88	0.95	0.39	2.32	4.33	0.87	21.48
Maternal education																		
Some college or more	Ref			Ref			Ref			Ref			Ref			Ref		
High school graduate	0.52	0.21	1.30	1.70	0.57	5.13	2.27	0.44	11.81	0.65	0.10	4.12	1.18	0.48	2.92	0.63	0.14	2.82
Less than high school	0.75	0.24	2.30	1.80	0.20	16.32	1 (Empty)			1 (empty)			0.41	0.05	3.54	0.45	0.10	1.91
Maternal age at birth																		
≤25 years	Ref			Ref			Ref			1 (empty)			Ref			Ref		
25–30 years	0.54	0.18	1.58	2.92	0.98	8.70	2.66	0.20	35.06	0.18	0.02	2.14	1.05	0.35	3.15	1.66	0.41	6.78
30–40	0.60	0.18	1.95	1.15	0.22	6.13	1.61	0.12	22.37	0.25	0.03	1.79	1.96	0.71	5.42	0.39	0.04	4.20
>40 years	1.25	0.39	4.02	1 (empty)			1 (empty)			1 (empty)			1.42	0.28	7.16	1.89	0.51	7.03
Child gender																		
Boy/girl	0.84	0.39	1.81	1.91	0.68	5.40	1.18	0.24	5.71	0.52	0.12	2.31	1.31	0.57	3.00	0.63	0.23	1.71
Number of children in the household																		
Only child	Ref			Ref			1 (empty)			Ref			Ref			Ref		
2–3 children	1.29	0.57	2.93	3.18	0.68	14.81	1 (empty)			0.11	0.02	0.62	0.77	0.29	2.09	0.73	0.21	2.52
4 or more children	1.67	0.19	14.92	6.55	0.35	122.94	1 (empty)			1 (empty)			1.37	0.33	5.66	3.13	0.42	23.15
Maternal psychological distress																		
Presence/absence	**4.83**	**2.10**	**11.11**	2.65	0.85	8.23	2.37	0.34	16.34	**9.10**	**1.79**	**46.17**	1.86	0.79	4.41	2.59	0.92	7.27
Low caring/medium or high caring	0.60	0.21	1.76	0.87	0.16	4.80	1 (omitted)			1.20	0.19	7.74	1.20	0.47	3.07	1.70	0.57	5.08
Single-/two-adult home	1.34	0.48	3.72	0.90	0.19	4.31	2.69	0.49	14.76	0.82	0.05	13.59	2.14	0.89	5.15	1 (omitted)		

Bold values indicate statistically significant odds ratios

Italic values indicate close to significant $p = 0.051$

this may apply to their parents, as well, which could explain the absence of an expected positive effect.

These socioeconomic problems could be associated with more stress in the family, which could explain why living in a two-parent home with at least one grandparent leads to more child mental health problems. However, in our study, the analyses controlled for maternal psychological distress. In addition, the study included proxies for income level such as maternal education level and family size, which did not decrease the negative association of grandparent presence with child mental health problems. We could then hypothesize that the presence of a grandparent, which could be the mother's parent or the father's parent, contributes to familial conflicts in the parent–child relationships, since generations differ in their attitudes towards children [1, 22]. This could be potentially amplified in Eastern Europe where adult children may be forced to stay in their parents' home creating a potentially conflicting situation as elders still assume decision-making authority on many aspects of the household including parenting. However, we cannot rule out the reverse hypothesis that is difficult children may push parents to live with their own parents to seek help with their trouble child, although the economic context of Eastern countries renders this hypothesis less plausible. Furthermore, the present study did not document the mental or physical health status of grandparents living at home, variables which certainly would have allowed us to have a better understanding of the level of burden associated with their presence. In addition, the study did not document the quality of relationships in place between children, parents, and grandparents' information that would have permitted a better understanding of complex intrafamilial dynamics likely to impact child mental health.

The present study has some limitations. First, the SDQ was completed by parents and teachers, and combined to determine child mental health, as recommended by the instrument's author. However the SDQ is not a clinical evaluation of child mental health clinically significant problems. Furthermore, for 9.63% children, we did not have information from both parents and teachers, and these children were, therefore, excluded from analyses. Second, household composition was measured at one point in time and did not include important variables such as the duration of the grandparent's stay, the reason that prompted the presence of a grandparent in the home, whether the parent is conflicted about the presence of the grandparent or whether the grandparent is from the mother's or the father's family. In addition, the cross-sectional nature of the study precluded the examination of possible effects of grandparents on child mental health over time. It is, therefore, impossible to draw conclusions on any causal relationships between household composition and child mental health. Socioeconomic status was approximated using maternal education only and was not directly assessed despite the importance of this factor. Some rare situations such as no parent in the household where at least one grandparent is present "skipped generation" have been pooled with the three-generation household: 33 households have this profile, 24 of which are in Romania (overall 2.57% of the households with grandparents), since they were too rare to conduct analyses and not large enough to produce an effect what we have checked by excluding them and redoing the analyses (table available upon request). We did not have information related to grandparent health status which may be very important as it relates to the potential emotional and financial contribution of healthy grandparents to the household or burden associated with age-related diseases such as dementia and serious chronic illnesses that require care. Importantly, while such information was not available, analyses conducted using grandparent age as a covariate did not show any effect of age on the presence of child mental health problems, which at least suggests that grandparent age alone is not a predictor of child well-being.

Despite these limitations, the current study shows that living in a three-generation home is associated with poor child mental health. The negative effect of three-generation household is marked in two-parent homes. In single-parent homes, the presence of a grandparent bears no significant association with child mental health. In countries such as Romania, Bulgaria, and, to a lesser extent, Lithuania, three-generation homes are common which brings attention to the risk carried by these families for the mental health of their child. Possibly, economic strains, the lack of affordable housing leads to forced co-residence of grandparents, which in turn adds strain to families already in difficult circumstances.

As improving the economy and the housing situation in certain countries is a very long-term and complex endeavor, programs may be developed to educate elderly people to better respect their children's role as parents so having a grandparent in the home can become an asset for family members rather than a burden. In addition, developing programs for supporting the elderly population, especially those who are suffering from health problems, may alleviate the family burden whether cohabiting or not with their children and grandchildren.

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Compliance with ethical standards

Conflict of interest The authors declared to have no conflicts of interest.

References

1. Dunifon R (2013) The influence of grandparents on the lives of children and adolescents. Child Dev Perspect 7(1):55–60. https://doi.org/10.1111/cdep.12016

2. Pilkauskas NV (2014) Living with a grandparent and parent in early childhood: associations with school readiness and differences by demographic characteristics. Dev Psychol 50(12):2587–2599
3. SHARE. Survey of Health, Ageing and Retirement in Europe. http://www.share-project.org/
4. Pittman LD, Boswell MK (2008) Low-income multigenerational households variation in family functioning by mothers' age and race/ethnicity. J Fam Issues 29(7):851–881
5. Bengtson VL (2001) Beyond the nuclear family: the increasing importance of multigenerational bonds. J Marriage Fam 63(1):1–16
6. Dunifon RE, Ziol-Guest KM, Kopko K (2014) Grandparent coresidence and family well-being implications for research and policy. Ann Am Acad Polit Soc Sci 654(1):110–126
7. Courtin E, Avendano M (2016) Under one roof: The effect of co-residing with adult children on depression in later life. Soc Sci Med 168:140–149. https://doi.org/10.1016/j.socscimed.2016.09.020. **(PubMed PMID: 27654932)**
8. Simons LG, Chen Y-F, Simons RL, Brody G, Cutrona C (2006) Parenting practices and child adjustment in different types of households a study of african american families. J Fam Issues 27(6):803–825
9. Kellam SG, Ensminger ME, Turner RJ (1977) Family structure and the mental health of children: concurrent and longitudinal community-wide studies. Arch Gen Psychiatry 34(9):1012–1022
10. Kovess V, Carta MG, Pez O, Bitfoi A, Koç C, Goelitz D et al (2015) The School Children Mental Health in Europe (SCMHE) Project: design and first results. Clinical Practice and Epidemiology in Mental Health: CP & EMH 11(Suppl 1 M7):113–23. https://doi.org/10.2174/1745017901511010113. **(PubMed PMID: PMC4378028)**
11. Ware JE, Kosinski M, Dewey JE, Gandek B (2000) SF-36 health survey: manual and interpretation guide. Quality Metric Inc., Lincoln
12. Goodman R (1999) The extended version of the Strengths and Difficulties Questionnaire as a guide to child psychiatric caseness and consequent burden. J Child Psychol Psychiatry 40(05):791–799
13. Goodman R (2001) Psychometric properties of the strengths and difficulties questionnaire. J Am Acad Child Adolesc Psychiatry 40(11):1337–1345
14. Goodman R, Renfrew D, Mullick M (2000) Predicting type of psychiatric disorder from Strengths and Difficulties Questionnaire (SDQ) scores in child mental health clinics in London and Dhaka. Eur Child Adolesc Psychiatry 9(2):129–134
15. Bergeron L, Valla JP, Breton JJ (1992) Pilot study for the Quebec Child Mental Health Survey: part II. Correlates of DSM-III-R criteria among six to 14 year olds. Can J Psychiatry 37(6):381–386 **(Epub 1992/08/01, PubMed PMID: 1394013)**
16. Arnold DS, O'Leary SG, Wolff LS, Acker MM (1993) The Parenting Scale: a measure of dysfunctional parenting in discipline situations. Psychol Assess 5(2):137–144. https://doi.org/10.1037/1040-3590.5.2.137
17. Shleifer AT, Normal Countries D (2014) The east 25 years after communism. Foreign Aff 93:92
18. Audit Urban (2016) City Statistics (urb) National Institute of Statistics, Eurostat
19. Husky MM, Boyd A, Bitfoi A, Carta MG, Chan-Chee C, Goelitz D et al (2018) Self-reported mental health in children ages 6–12 years across eight European countries. Eur Child Adolesc Psychiatry 27(6):785–795. https://doi.org/10.1007/s00787-017-1073-0 **(PubMed PMID: 29082450)**
20. Kellam SG, Ensminger ME, Turner R (1977) Family structure and the mental health of children: concurrent and longitudinal community-wide studies. Arch Gen Psychiatry 34(9):1012–1022. https://doi.org/10.1001/archpsyc.1977.01770210026002
21. Deleire T, Kalil A (2002) Good things come in threes: single-parent multigenerational family structure and adolescent adjustment. Demography 39(2):393–413. https://doi.org/10.1353/dem.2002.0016
22. Jennifer March A, Raley RK (2012) Multigenerational households and the school readiness of children born to unmarried mothers. J Fam Issues 34(4):431–459. https://doi.org/10.1177/0192513X12439177