

Ursula Napoli  
Vanna Axia  
Pier Antonio Battistella

## Family ecology in children with primary headache

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U. Napoli • V. Axia,  
Department of Developmental and Social  
Psychology,  
University of Padua, Padua, Italy

P.A. Battistella (✉)  
Department of Pediatrics,  
University of Padua,  
Via Giustiniani 3, I-35128 Padua, Italy  
e-mail:  
Tel.: +39-049-8213505  
Fax: +39-049-8213502

**Abstract** The focus of this paper is the family factors associated with primary headache in children between 8 and 14 years. We studied the differences in the family ecology between 32 children with headaches and 32 healthy controls. The families were comparable for socio-economic status and children's age. We examined various aspects of the family connectedness, daily workload, social network and support, ecological fit and resilience using an Italian version of the Ecocultural Family Interview. Families of juvenile headache patients have less resilience in using their subsistence base, less social support and are less closely

knitted than the control families. No difference was found for the amount of domestic workload. These findings suggest that psychosocial environment and family ecology are relevant to children's headaches, and that clinical support can be planned to sustain parents of children affected by primary headache.

**Key words** Juvenile primary headache • Ecocultural family interview

### Introduction

Recurrent headache is a common symptom in children. By the age of seven, about 30%–50% of children have experienced headache [1–4]. These proportions dramatically increase during adolescence and may reach the 90% of the adolescent population [1, 5, 6]. About 15% of school age children suffer from recurrent headache, either tension-type headache or migraine, once a week or more [7–9].

The frequency, intensity and quality of headaches have been associated with complex interactions between biological, psychological and socio/environmental factors [10–13]. Psychosocial mechanisms may be relevant in the etiology and pathogenesis of primary headaches and include social and economic status, resilience, housing conditions, family conditions, life events, school conditions and performance,

leisure time activities, quality of life, situational factors, coping responses, psychiatric and somatic comorbidity, and behavioral problems [14]. A controlled study [14] of children and adolescents with primary headache showed that migraine is not related to family and housing conditions, school situation or peer relations, whereas tension-type headache is associated with a higher rate of divorced parents and fewer peer relations.

There is substantial agreement on the role of the family in the development, maintenance and/or worsening of recurrent headache in adults [15–17]. The family not only has a crucial effect in the development of psychosomatic illnesses [18–21] but also is the basic unit for the health care of its members [22]. Given the broad consensus among researchers and clinicians in the field on the relevance of the family, it is surprising that few studies investigated the role of family factors on children affected by primary headaches.

The weight of the family relationship and the dynamics of the psychological development in childhood have been considered only in a few studies that highlight the relationship difficulties within the families of headache children, which inhibit the child's disengagement and autonomy [23]; families of migrainous children reported unhappiness more often than did families of children with non-migraine headache [24]. Larsson [7] found that the families of children with headache have a higher divorce rate, more family conflicts and higher parental stress. More broadly, negative life events, avoidant coping strategies, emotional disturbances and low social support in the family are associated with psychological or even physical illnesses in children [25]. Routine dysfunctional patterns of communication and behavior may affect the psychological and also physical health of its adult members [18].

There are many ways to conceptualize and then study family factors. It is our view that the family should be considered as an ecocultural unit, whose primary function is the adaptation of its members to the surrounding broader ecology of the place [26–29]. The ecocultural theory predicts that the major factors affecting the family adaptation processes are its resilience (i.e. its ability to use purposefully the available resources) [30], the domestic workload needed to keep the daily routine going [31], the social support for the family [32] and the internal connectedness and agreement of its members [31]. The main hypothesis of our study is that the families of children with primary headaches have lower scores in these factors than the families of healthy children. If this is true, we could conclude that the families of children with recurrent headaches have less adaptive skills and we could plan family oriented interventions to support them. The adaptation is achieved mostly by the family activities organized into flexible but stable daily routines [28, 32]. As a consequence, for the purposes of this study, we used an Italian version of the Ecocultural Family Interview (EFI) [33], which is a guided conversation about the family daily activities and is focused upon the family adaptation processes [34].

## Materials and methods

Participants of the study were 64 families, including 32 families with headache children (clinical group) and 32 families with healthy children (control group), all living in the areas of Padua and Venice (Northern Italy). All the parents lived in marriage with each other, except for four families (two per each group) in which there was only one parent (the mother). We considered only one headache child per family.

To assess the socio-economic status (SES) comparability of the two groups, the Hollingshead index [35, 36] was first computed on a sample of 40 families with healthy children of the same ages.

From this sample, 32 families were extracted to generate the control group with an SES matching that of the families with headache children. In addition, a *t* test comparison revealed that the two groups could be safely considered to have the same SES (61 df,  $t=0.63$ , not significant). The Hollingshead index measures the status score of an individual or a nuclear family unit combining information on gender, marital status, education and occupation [35, 36]. The rationale for this methodological choice is that we were interested in the family adaptation processes that can potentially be supported clinically, whereas SES differences raise an entirely different set of issues.

The inclusion criteria for the children of families of the clinical group were: (a) primary headache, i.e. diagnosis based on clinical and follow-up assessments; (b) duration of symptoms >6 months; (c) number of headache attacks >3 in the previous year; (d) no pharmacological prophylaxis; and (e) no siblings suffering from headache. All juvenile out-patients were diagnosed at the Headache Clinic of the Pediatric Department of the University of Padua, according to international criteria [37]. They were recruited in the period from September to November 2000, when they came for the first visit to the clinic.

The inclusion criteria for the children of families comprising the control group were: (a) age range between 8 and 14; (b) absence of recurrent headache and pain, e.g. abdominal or rheumatic pain; (c) no headache attacks in the previous year; (d) absence of chronic illness; and (e) no pharmacological treatment. All control families were recruited randomly following a snow-ball procedure (every family we contacted gave us the telephone number of other families, so that we had always parents to interview).

The Ecocultural Family Interview (Italian version [38]) focused on family daily activities and lasted about one hour. All interviews were tape-recorded and then transcribed. From the parental narratives several issues can be reliably identified and scored [34, 39, 40]. For the purposes of this study, two independent judges scored the 64 narratives along 33 items describing various aspects of the family connectedness, daily workload, social network and support, ecological fit and resilience, etc. Each item has a score ranging from 0 to 8, where 8 represents the maximum presence or intensity of the variable. If the results of the two independent judges were different, an agreement was reached. The inter-rater agreement was 0.72 for the clinical group and 0.70 for the control group. The 33 items belongs to 4 dimensions: Resilience of Subsistence Base, Domestic Workload, Family Connectedness, and Social Support. The clinical and control groups were compared by two-tailed *t* tests for the 4 dimensions and for each of the 33 items.

Informed consent was obtained from all the participants and the study was approved by the Ethical Committee of the School of Medicine, University of Padua.

## Results

We studied 32 families with children with primary headache (clinical group), and 32 control families with children without headache, matched for socioeconomic status (SES) and age of the children. The age range of children was 8–14

(mean age 11.2±2.4 in the clinical group and 10.7±2.2 in the control group). The difference was not significant. Moreover, there were no significant differences between the two groups in the variable “headache in parents”: 19 parents suffered from recurrent headache in the clinical group as did 17 parents in the control group.

In the clinical group there were 17 children with migraine without aura (MWA), 11 cases of episodic tension-type headache (ETTH) and 4 cases of chronic tension-type headache (CTTH). Table 1 shows the headache patterns in three clinical subgroups.

The Ecocultural Family Interview revealed that families of headache children had significantly less resilience in using their subsistence base and less social support and were less closely knitted (family connectedness) than the control families (Table 2). No difference in the amount of domestic workload was found between the two groups.

The more detailed item-by-item comparisons (Table 3) revealed that 12 items out of 33 were significantly different in the two groups (clinical versus control group). In the families of headache children, the fathers spent less time with their families and were less available for the common activities (item 7). In addition, the marital couple had a lower degree of agreement about child care (item 6). The control group had more close knit families (item 5), the decisions were more shared among all the family members (item 5),

and they expressed more positive feelings of belonging and togetherness (item 5). Not surprisingly, the mothers of the headache children were less satisfied with the received amount of support (item 9) and also in their work (item 1). Several differences were found in the amount of social support received by the two groups. The families of children with headache relied less upon the extended family to keep their routine going and for child care (item 4), even when the child was ill (item 12) or in pain (item 12). This is surprising since families with headache children would probably need more external help for child care than families with healthy children. The families with headache children not only were less supported by the extended family, but they also had fewer contacts and good relationships with the neighborhood (item 10 and 11). The mothers of headache children received overall less support than the control mothers (item 8). Finally, in addition to the target child, another chronically ill or impaired member was found more often in the families of headache children than in the control families (item 3). It is noteworthy that, even in such difficult situations, the families of headache children spent notable efforts to organize their daily routines taking into account the child’s needs (item 2). In this, they were superior to the families of healthy children.

The type of headache (migraine without aura versus tension-type headache) was considered in relation to the 4

**Table 1** Headache pattern of the 32 children with headache (clinical group). Values are number (percentage) of subjects unless otherwise indicated

	Migraine without aura (n=17)	Episodic tension-type headache (n=11)	Chronic tension-type headache (n=4)
Frequency, n/month <sup>a</sup>	3.5 (2.3–6.2)	6.3 (3.2–11.4)	23.3 (16.2–27.4)
Intensity			
Mild	0 (0)	3 (27)	2 (50)
Medium	12 (71)	8 (73)	2 (50)
Strong	5 (29)	0 (0)	0 (0)
Duration, h/day			
<4	8 (47)	3 (27)	0 (0)
4–8	7 (41)	7 (64)	2 (50)
>8	2 (12)	1 (9)	2 (50)
Nausea, n	5 (29)	0 (0)	1 (25)
Vomiting, n	5 (29)	0 (0)	0 (0)

<sup>a</sup> Values are mean (range)

**Table 2** Results of the Ecocultural Family Interview, aggregated into the 4 dimensions, by study group. Values are mean (standard deviation)

	Resilience of subsistence base	Social support	Family connectedness	Domestic workload
Clinical group	3.1 (1.0)	3.3 (0.8)	4.7 (1.6)	3.3 (0.8)
Control group	3.7 (0.8)	4.2 (0.5)	5.8 (0.9)	3.1 (0.5)
<i>t</i> value	-2.33	-4.95	-3.35	0.87
<i>p</i> (62 df)	0.023	0.001	0.001	0.05

**Table 3** Results of some of the 33 items of the Ecocultural Family Interview, by study group. Values are mean (standard deviation) of the scores on a scale of 0 to 8 (maximum intensity)

Item	Clinical group	Control group	<i>t</i> value	<i>p</i>
1. Work has a positive effect on mother	4.0 (2.2)	5.4 (1.7)	-2.8	0.01
2. Family arranges family time or schedules around the child	2.6 (2.2)	1.5 (1.4)	2.3	0.05
3. Further workload for another chronically ill or impaired member	1.6 (2.7)	0.1 (0.3)	3.0	0.01
4. Family relies on help from extended family	1.9 (2.0)	3.1 (2.2)	-2.2	0.05
5. Connected family	4.6 (1.6)	5.8 (0.9)	-3.9	0.001
6. Marital agreement about child care	4.7 (1.6)	5.5 (1.0)	-2.5	0.01
7. Role of current man in mother's life	4.7 (1.8)	5.9 (1.1)	-2.9	0.01
8. Emotional support for primary caretakers	3.5 (1.3)	5.4 (0.9)	-6.9	0.001
9. Feelings about support	3.3 (1.8)	5.2 (0.9)	-5.5	0.001
10. Relations of the family with neighborhood	3.9 (2.0)	5.5 (1.5)	-3.7	0.001
11. Amount of help mother receives with childcare from nonrelatives	2.0 (1.9)	3.3 (2.0)	-2.7	0.01
12. Amount of help/support mother receives when child is ill or in pain	1.6 (1.6)	3.0 (2.3)	-3.0	0.01

**Table 4** Results of the Ecocultural family Interview, aggregated into the 4 dimensions, by two different type of headache sufferers

	Resilience of subsistence base	Special support	Family connectedness	Domestic workload
Migraine without aura (n=17)	3.0±0.5	3.3±0.8	4.8±0.5	3.3±0.7
Tension-type headache (n=15)	3.1±0.8	3.1±0.5	4.6±0.8	3.3±0.6
<i>p</i>	ns	0.05	0.05	ns

*ns*, not significant

dimensions of the test. There was a lower level of family connectedness and social support in the subgroup with 15 children suffering from tension-type headache compared to the group with 17 children with migraine without aura (Table 4). No differences were found between the two groups considering the other two dimensions (resilience of subsistence base and domestic workload).

## Discussion

The results of our study highlight that there are significant differences in the organization of daily routines between the families of children affected by recurrent primary headaches and control families. The balance between overall resources and needs strongly affects how families cope with problems. For example, families with headache children could rely less on the extended social network typical of the community in which they live than could the control group. Families with headache children had less help from relatives or friends to keep the daily routine going than did the control group. So the families of headache children had to rely on their own resources in coping with events and problems. These families were also less closely knitted and parents disagreed more on childcare.

Future research should assess whether lack of social support leads to a less harmonious family life or whether the

causal direction is the opposite. At any event, these results suggest that families of headache children may need psychosocial intervention programs aimed at supporting them and at easing their communication strategies.

Our results suggest that families with headache children may be overall more stressed compared to the control families. They have to manage the child's headache, they have less social support, they have to deal with more family conflicts and the mothers are less satisfied with their jobs. In addition, families with headache children often have further worries about another member of the family with physical or psychological disease or impairment. That means that they often have to spend additional time and energies to look after somebody else that lives in the house.

Another important issue for future research is the assessment of the levels of stress in the families of headache children and the identification of the more dysfunctional coping strategies. Again, information of these topics would enable us to plan and implement ad hoc psychosocial interventions.

Within the clinical group, families with children with migraine had less problems in their daily routines compared to families having a child with tension-type headache. This is in agreement with our results published elsewhere [41] in which the migraine subgroup perceived the daily routines as less stressful and had a better relationship with the medical services. Moreover, the high frequency and duration of

attacks had a negative influence on the parents and on the daily routine [41].

Family problems and disturbed family relationships may be more common in families with children with severe headache or psychiatric comorbidity [42]. Anxiety and depression in the parents of juvenile headache sufferers have been investigated in small samples only, giving conflicting conclusions [43].

Our results fit with the previous literature. For example, Patterson and McCubbin [19] suggested that stress and family conflicts have an important role in recurrent pain and that social support could be a solution for it. Holahan and Moos [25] found that social support of parents is predictive (with other variables) of physical and psychological symptoms in children. Larsson [7] found that a stressful factor in headache children's lives is the

higher rate of parental divorce and family conflicts compared to the control group.

Our conclusion is that the family ecology is part of our understanding of children's headache. The differences found between the clinical and control groups reveal that families with children affected by primary headaches have less resources and more problems and it is likely that their adaptation processes are less successful or, at least, more costly. The next step is to investigate more closely the specific relationships between family functioning and headache pattern in children. If family ecology plays an important role in children with recurrent headache, further research should investigate more how family interactions and ways of responding to events affect children's headache. The impact of children's headache on family routines should also be examined more carefully.

## References

1. Bille B (1962) Migraine in school children. *Acta Paediatr* 51[Suppl 136]:1–51
2. Sillanpaa M, Anttila P (1996) Increasing prevalence of headache in 7-year-old schoolchildren. *Headache* 36:466–470
3. Metsahonkala MD, Sillanpaa MD, Tuominen J (1998) Social environment and headache in 8- to 9-year-old children: a follow-up study. *Headache* 38:222–228
4. Bener A, Uduman MD, Qassimi EMA, Khalaily G, Sztrihai L, Kilpelainen H, Obineche E (2000) Genetic and environmental factors associated with migraine in schoolchildren. *Headache* 40:152–157
5. Linet MS, Stewart WF, Celentano DD, Ziegler D, Sprecher M (1989) An epidemiologic study of headache among adolescents and young adults. *JAMA* 261:2211–2216
6. Barea LM, Tannhauser M, Rotta NT (1996) An epidemiologic study of headache among children and adolescents of southern Brazil. *Cephalalgia* 16:545–549
7. Larsson B (1988) The role of psychological, health-behaviour and medical factors in adolescent headache. *Dev Med Child Neurol* 30:616–625
8. King NJ, Sharpely CF (1990) Headache activity in children and adolescents. *J Paediatr Child Health* 26:50–54
9. Abu-Arefeh I, Russel G (1994) Prevalence of headache and migraine in schoolchildren. *BMJ* 309:765–769
10. Martin PR, Milech D, Nathan PR (1993) Towards a functional model of chronic headaches: investigation of antecedents and consequences. *Headache* 33:461–470
11. Wall BA, Holden EW, Gladstein J (1997) Parent responses to paediatric headache. *Headache* 37:65–70
12. Svensson DA, Larsson B, Bille B, Lichtenstein P (1999) Genetic and environmental influences on recurrent headache in eight to nine-year-old twins. *Cephalalgia* 19:866–872
13. Bandell-Hoekstra I, Abu-Saad HH, Passchier J, Knipschild P (2000) Recurrent headache, coping, and quality of life in children: a review. *Headache* 40:357–370
14. Karwautz A, Wober C, Lang T, Bock A, Wagner-Ennsgraber C, Vesely C, Kienbacher C, Wober-Bingol C (1999) Psychosocial factors in children and adolescents with migraine and tension-type headache: a controlled study and review of the literature. *Cephalalgia* 19:32–43
15. Roy R (1986) Marital conflicts and exacerbation of headache: some clinical observations. *Headache* 26:360–364
16. Ehde DM, Holm JE, Metger DL (1991) The role of family structure, functioning, and pain modelling in headache. *Headache* 31:35–40
17. Kopp M, Richter R, Reiner J, Kopp-Wilfling P, Rumpold G, Walter MH (1995) Differences in family functioning between patients with chronic headache and patients with chronic low back pain. *Pain* 63:219–224
18. Minuchin S, Rosman B, Baker L (1981) *Psychosomatische Krankheiten in der Familie*. Klett, Stuttgart
19. Patterson JM, McCubbin HI (1983) The impact of family life events and changes on the health of a chronically ill child. *Fam Relat* 32:255–264
20. Payne B, Norfleet MA (1986) Chronic pain and the family: a review. *Pain* 26:1–22
21. Turk DC, Flor H, Rudy TE (1987) Pain and families. I. Etiology, maintenance, and psychosocial impact. *Pain* 30:3–27
22. Litman TJ (1974) The family as the basic unit in health and medical care: a social behavioural overview. *Soc Sci Med* 8:495–499
23. Fornara R, Cerutti R, Marioni P, Moschetta A, Guidetti V (1989) The child with migraine and his family: a systemic approach. *Cephalalgia* 9[Suppl 10]:234–236
24. Guidetti V, Galli F (2001) Recent development in paediatric headache. *Curr Opin Neurol* 14:335–340

25. Holahan CJ, Moos RH (1987) Risk, resistance, and psychological distress: a longitudinal analysis with adults and children. *J Abnorm Psychol* 96(1):3–13
26. Weisner TS (1984) Ecocultural niches of middle childhood: a crosscultural perspective. In: Collins WA (ed) *Development during middle childhood: the years from six to twelve*. National Academy of Science, Washinton, pp 335–369
27. Gallimore R, Weisner TS, Kaufman SZ, Bernheimer LP (1989) The social construction of ecocultural niches: family accomodation of developmentally delayed children. *Am J Ment Retard* 94:216–230
28. Bernheimer LP, Koegh BK (1995) Weaving interventions into the fabric of everyday life: an approach to family assessment. *Topics Early Childhood Special Ed* 15(4):415–433
29. Keogh BK, Bernheimer LP, Gallimore R, Weisner TS (1998) Child and family outcomes over time: a longitudinal perspective on developmental delays. In: Lewis M, Feiring C (eds) *Families, risks, and competence*. Erlbaum, Mahwah, pp 269–287
30. Gallimore R, Weisner TS, Bernheimer LP, Guthire D, Nihira K (1993) Family responses to young children with developmental delays: accomodation activity in ecological and cultural context. *Am J Ment Retard* 98(2):185–206
31. Nihira K, Weisner TS, Bernheimer LP (1994) Ecocultural assessment in families of children with developmental delays: construct and concurrent validities. *Am J Ment Retard* 98(5):551–566
32. Nihira K, Sakagami H, Kanenaga H, Koga H, Suzuky T (1995) Family support for children with developmental delay: a cross-cultural observation. *J Jpn Publ Health Assoc* 42:1197
33. Weisner TS, Coots JJ, Bernheimer LP, Arzubiaga A (1997) *The Ecocultural Family Interview*. UCLA, Ecocultural Scale Project, Los Angeles
34. Axia G, Weisner TS (2000) La valutazione dell'ecocultura familiare. In: Axia G, Bonichini S (eds). *La valutazione del bambino*. Carocci, Rome, pp 255–283
35. Hollingshead AB, Redlich FC (1958) Social class and mental illness. Wiley, New York, pp 387–397
36. Hollingshead AB (1971) Commentary on the indiscriminate state of social class measurement. *Social Forces* 49:563–567
37. – (1988) Classification and diagnostic criteria for headache disorders, cranial neuralgias, and facial pain. *Headache Classification Committee of International Headache Society Cephalalgia* 8(7):1–96
38. Frare M, Axia V, Weisner TS (2000) In: *The Ecocultural Family Interview - Paediatric Functional Pain Version*. Ecocultural Scale Project, Padova
39. Winton PJ (1988) The family-focused interview. An assessment measure and goal setting mechanism. In: Bailey DB, Simeonson RJ (eds). *Family assessment in early intervention*. Merrill, Columbus, pp 185–206
40. Beckman PJ, Bristol MM (1991) Issues in developing the IFSP: a framework for establishing family outcomes. *Topics Early Childhood Special Ed* 11:19–31
41. Frare M, Axia V, Battistella PA (2002) Quality of life, coping strategies and family routines in children with headache. *Headache (in press)*
42. Maratos J, Wilkinson M (1982) Migraine in children: a medical and psychiatric study. *Cephalalgia* 2:179–187
43. Kowal A, Pritchard D (1990) Psychological characteristics of children who suffer from headache: a research note. *J Child Psychol Psychiatry* 31:637–649