Appraisal of childhood fever by German and Turkish mothers in Germany–results of a pilot study

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The cultural background of patients and parents is increasingly recognized as a relevant influence on health behavior. This study was conducted to test the validity and reliability of a questionnaire to investigate fever concepts among German and Turkish mothers living in Germany and to develop hypotheses on important correlations between cultural background and specific perceptions, explanations, fears, and measures taken when confronted with fever. We conducted 50 face-to-face interviews with Turkish and German mothers and 40 re-interviews by telephone.

Validity of items was tested by discussion of videotaped interviews, cognitive interviewing and problem coding. To determine the reliability of items, Cohen's kappa was calculated.

We found good results for validity and moderate to excellent results for reliability. The results of this pilot study indicate a relevant influence of the cultural background on the perception, explanation and treatment of childhood fever by mothers. However, a larger sample is required to adjust for educational and socioeconomic status.

Key words: childhood fever, mother's perspective, culture, Turkish, German.

Fever is one of the most common reasons to consult a pediatrician. It accounts for 19-30% of all practice visits[1]. In the majority of cases, the underlying disease is relatively harmless and self-limiting from a medical point of view. In a cohort of 20,585 children, Finkelstein[1] found 14 cases of bacterial meningitis and 1 death from fulminant sepsis during a three-year observation period. Focusing on etiology and ruling out a serious disease, therefore, are the most important tasks for the physician when seeing a febrile child[2].

However, fever is a relevant concern for parents and frequently leads them to seek professional help. In 1980, Schmitt[3] introduced the term "fever phobia" to describe parents' fearful view of fever. A number of studies have been conducted since then that examined parents' knowledge, perceptions, theories, and practices with respect to childhood fever[3-9]. A frequent finding is that parents are not correctly informed about the temperature defining fever. They administer antipyretics incorrectly and use healthcare services inappropriately. In an Italian study, Impicciatore et al.[9] found that the mother's level of concern was influenced by a temperature >39.0°C, absence of information on the management of fever, a low educational level, lack of other siblings of the child, and the mother's residence in southern Italy. Another study, by Taveras et al.[11], examined the beliefs and practices in a sample of Caucasian, Hispanic and African-American parents in the United States, and found a strong influence of the cultural background in addition to the educational level and socioeconomic status.

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Interestingly, they found not only potentially harmful practices, such as the frequent use of aspirin in African-American families, but also the treatment of fever in the Latino population as a folk illness that can cause fever, e.g. *mal de ocho*. The authors argue that the treatment of fever as a folk illness by the parents can delay medical evaluation and therefore could be potentially dangerous to the child.

To conclude, there are two important reasons for the physician to deal with parents' view on their child's fever. Firstly, it is important to counsel parents effectively, as they are the principal caregivers of the child. Knowledge of their concerns, theories and practices is a prerequisite for adequate advice[12]. Secondly, some practices performed by parents can be potentially harmful to the child, e.g. overdose of antipyretics or a delay in seeking professional help. It is important to address these in order to avoid causing harm[11].

The specific situation of children with a migrant background has been increasingly recognized in Germany during the last 5-10 years. In 2008, the German Health Interview and Examination Survey for Children and Adolescents (KIGGS) stated significant differences in health status and quality of life between migrant children and the autochthonous population. Children with a migrant background are more frequently obese[13,14] and suffer from caries more often[15]. Higher infection rates with *Helicobacter pylori* have also been reported[16]. However, children from migrant families suffer less frequently from asthma and atopy[17-19]. They also smoke less and drink less alcohol[20]. Additionally, the use of medical services differs[21,22]. Children with a migrant background participate significantly less in early diagnostic tests than the autochthonous population. With regard to the vaccination rates, the KIGGS study showed that especially children with migrant background between 11-17 years have poorer vaccination rates than non-migrants[23].

The reasons for these differences are complex. Aside from genetic, social and economic factors influencing the health behavior and the development of diseases, the cultural background of patients and the migration experience itself play an important role[24-26]. Ipsiroglu[24] argues that pediatricians are obliged to act in the best interest of the children. Regarding children with a migrant background, this means that the specific circumstances of an individual child should be considered, e.g. in the counselling of a family with a non-German background. Furthermore, the access to health services for patients with a migrant background is impeded in some cases. This can have different causes. For asylum seekers whose residence permit status is insecure, reimbursement of medical services by health insurance and the community councils is limited to the treatment of acute disorders and painful conditions. In contrast, treatment for chronic disorders is not covered[27]. Language barriers are another problem. Medical institutions do not provide sufficient support for translating, which results in a significant barrier to health services for migrants with little knowledge of the German language[28].

In order to analyze the relationship between cultural backgrounds, migration experience, and economic and educational status with regard to fever concepts among German and Turkish mothers living in Germany, we developed a questionnaire to be used in face-to-face interviews. This report describes the strategy used to develop the questionnaire and presents the results of the pilot study in order to develop hypotheses on important correlations and to determine the questionnaire's reliability.

Material and Methods

Questionnaire Development

Parents' knowledge and practices when dealing with childhood fever have been studied in several countries, but not yet in Germany. To identify relevant publications on this topic, we consulted PubMed, Embase, Cinahl, PsychInfo, and CareLit electronic databases for the period 1980-2009, using the terms "fever", "knowledge", "children", "lay theory", "patient's concepts", and "study". We found 11 articles that gave relevant information about the parents' perception of childhood fever. Where the items fit our model, we adopted the items and concepts of these studies.

Parallel to the literature review, we conducted a study with 20 open, semi-structured interviews with German and Turkish mothers living in Germany about childhood fever, the mother's role, family context, and living in Germany. We

performed a content analysis of the verbatim transcripts to identify themes and items. Based on the interview analysis and the results of the review, we developed a model of factors influencing fever concepts that forms the framework for this study (Fig. 1).

In order to describe the socioeconomic and educational status, we used the items of the KIGGS survey[29,30] that have been tested and validated and allow comparisons with our findings.

The preliminary version of the questionnaire was modified during a pre-test phase. In the initial step, we presented the first version of the questionnaire to an expert panel of pediatricians (n=2), methodologists (n=3) and experts on German and Turkish culture (n=3). Their comments and recommendations were included, which led to a first revision of the questionnaire. We then performed eight face-to-face interviews with three interviewers that were videotaped and analyzed with regard to interviewer-interviewee interaction as well as clarity of questions and items. The videotapes were discussed in a group consisting of the three interviewers, the principal researcher and one senior researcher, and an interviewing expert. In addition, we conducted a cognitive interview after each interview with the interviewee aiming to elicit her understanding of the questions and items. After these steps, the questionnaire was modified and finalized. In its final form, the questionnaire included the following groups of items:

Fever-related items

- Signs of fever (16 items, using a 3-point ordinal scale with the scoring options: 0= "agree", 1= "disagree", and 2= "indifferent")
- Causes of fever (22 items, using a 3-point ordinal scale with the scoring options: 0= "agree", 1= "disagree", and 2= "indifferent")
- Measures taken against fever (30 items, using a 3-point ordinal scale with the scoring options: 0= "use", 1= "do not use")

Socioeconomic data

- The socioeconomic index by Winkler comprising the undergraduate educational level, the professional position and the average monthly income[31,32].

Personal and medical data

- Consultation of physicians, fatal illness in the family
- Biographic data (age, family background, migratory background)

During the interviews, the interviewers kept records regarding any difficulties in understanding on the part of the interviewees (problem coding).

Study Setting and Sample

The study took place in the outpatient departments of two German pediatric hospitals in Herdecke (Community Hospital) and Wuppertal (Helios Clinics) in November and December 2008. A convenience sample comprised of mothers with a non-life-threatened child was used. The child did not need to have fever at the time of the interview. The questions referred to the last fever episode of the youngest child if the mother had more than one. Mothers visiting the outpatient clinic on weekends were introduced to the purpose of the study and were asked to participate. Fifty mothers were included in this pilot study. The mothers were selected on the basis of their anticipated waiting time, addressing the one with the longest anticipated time at first. They did not receive any incentive for participation. The mothers' cultural background was estimated by the structure of the surname and confirmed at the beginning of the interview. The interviews took place in a separated area of the waiting room, lasted 35 minutes on average and were conducted by trained

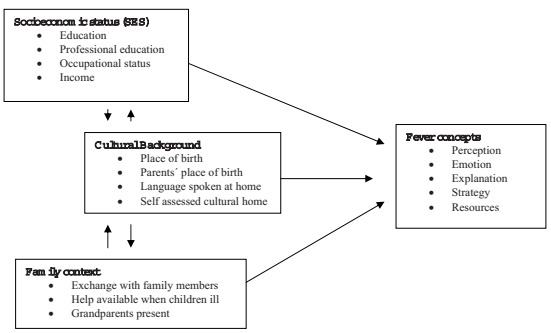


Fig. 1. Model of influence on fever appraisal.

interviewers. As two of the interviewers were Turkish native speakers, the interviews could be conducted in either German or Turkish as preferred by the participating mothers. One week after the initial interview, the same interviewer conducted a second interview by telephone using the same questionnaire in order to test for reliability of items. Mothers were asked beforehand regarding their further participation and for their contact details.

Each interview was treated as anonymous and transcribed into a database. Ethical approval for the study was given by the Ethics Committee of Witten/Herdecke University.

Statistical Analysis

Statistical analysis of the sample included descriptive statistics giving item percentages or subscale means with confidence intervals of 95%. Due to the exploratory character of the study, differences between German and Turkish mothers were tested using the chi-square test for nominal variables and Mann-Whitney U test for independent samples for continuous variables (i.e. subscales). We judged $p<0.05$ to be significant, and $p>0.05$ - 0.10 as a trend. To test for the reliability of items of the fever concepts, a second interview was conducted by telephone. The items to determine the socioeconomic index were not queried in the second interview as those are validated and extensively used. Test-retest reliability was quantified using Cohen's kappa coefficient k. Kappa values lower than 0.2 were judged as slight agreement, $0.2<k<0.4$ as fair agreement, $0.4<k<0.6$ as moderate agreement, $0.6<k<0.8$ as substantial agreement, and $0.8<k<1$ as almost perfect agreement in accordance with Landis et al.[33]. All data analysis was conducted using SPSS Version 15.01.

Results

Demographic characteristics

In total, 27 German and 23 Turkish mothers were interviewed. Demographic characteristics are shown in Table I. The cultural background was determined by the place of birth. A Turkish cultural background was considered present if mothers were born in Turkey or if one parent was born in Turkey. A German cultural background was considered present if the mothers or their parents were born in Germany. The average age of German mothers (34.6 ± 5.6 years) was significantly higher than that of Turkish mothers (30.2 ± 6.3 years; $p<0.01$). The socioeconomic index by Winkler comprises the undergraduate educational level, the professional position and the average monthly income. It was 4 out of 21 points lower in the Turkish compared to the German group. As family support is an important factor when caring for a sick child, we asked for the distance between the households of the parents and that of the grandparents. For 20 of 27 German families, the grandparents lived nearby, whereas only 8 of 23 of the Turkish mothers had access to this potential resource ($p<0.01$).

The sample of Turkish mothers was heterogeneous in terms of country of birth, citizenship and country of undergraduate qualification (Table II). Sixty-one percent of mothers with Turkish background were born

Table I. Demographic Characteristics

	German	Turkish	Total	p-value
Cultural background	27	23	50	
Average age	34.6 (SD 5.6)	30.2 (SD 6.5)	32.6 (SD 6.3)	<0.01
Average number of children	1.7 (SD 0.8)	2.0 (SD 1.1)	1.8 (0.9)	0.46
Socioeconomic level	14.2* (SD: 4.1)	10.1* (SD: 4.5)	12.3 (SD: 4.7)	< 0.01
Average number of persons in the household	3.9 (SD: 1.0)	4.3 (SD: 1.6)	4.1 (SD: 1.3)	0.30
Grandparents nearby (same household or town/ different town or abroad	20/7	8/15	28/22	< 0.01

* Median socioeconomic index (Winkler, possible values 3-21).

Table II. Characteristics of the Turkish Population

	Germany/German	Turkey/Turkish	Kurdish
Country of birth	39% (9)	61% (14)	
Citizenship	30% (7)	65% (15)	
Country of undergraduate qualification	52% (12)	48% (11)	
Language primarily spoken at home	17% (4)	74% (17)	9% (2)
Parent's country of birth	4% (1)	96% (22)	
Place of residence before 18 years of age	83% (19)	17% (4)	

in Turkey. Their time living in Germany ranged from 3 to 37 years, with an average of 18.5 years. Fifty-two percent finished school in Germany whereas 43.4% graduated in Turkey; one individual declined to answer.

As migration can also occur within a country and influence living conditions, we asked German mothers whether their place of birth was in the former East or West Germany. Three of the 27 interviewed mothers were born in the east (11%).

Fever definition and measurement

The temperature at which mothers defined fever did not differ significantly among the groups (not significant, ns): the mean was 38.4 ± 0.4°C in German and 38.3 ± 0.5°C in Turkish mothers.

Ninety-five percent of German mothers and 82% of Turkish mothers reported using a thermometer for temperature measurement (ns). Both groups of mothers used the rectum to assess the child's body temperature (German mothers: 73%; Turkish mothers: 70%) followed by the ear (German mothers: 35%; Turkish mothers: 20%), the axilla (German mothers: 11%; Turkish mothers: 25%) and the mouth (German mothers: 4%; Turkish mothers: 5%).

Signs of fever

The way mothers perceived their child's fever was queried in 16 items. They included tactile changes, e.g. warm skin, visual changes, e.g. red cheeks, and behavioral changes, e.g. cries more than usual. Statistically significant differences were found in only three items. More Turkish mothers reported that their child had flame-red cheeks (91.3% vs. 59.3%, p=0.01) and that the child is weak in the presence of fever (95.7% vs. 70.4%, p=0.02). However, the item "child is calmer than usual" was answered more often by German mothers (92.6% vs. 65.2%, p=0.03). The other items did not show any or a significant difference.

Causes of fever

We used 20 items for this question. Thematically, the items can be grouped in infections and transmissions, climatic conditions and temperature changes, social stressors, and supernatural causes. As we wanted to probe for the knowledge of familial Mediterranean fever, which has a prevalence of 0.1% in the Turkish population, we asked explicitly for this item as well (Table III).

We found differences in the group of social stressors. Thirty percent and 22% of German mothers stated that fever could be caused by stress in kindergarten/school or by an argument in the family, respectively. However, these rates in Turkish mothers were 22% and 9%, respectively (ns for both).

Items that refer to temperature changes were answered positively more often by Turkish mothers. Walking barefoot (44% vs. 11%, p=0.01), insufficient warm clothing (39% vs. 33%, p=0.88) and eating ice cream (26% vs. 4%, p = 0.02) were seen as possible causes of fever more frequently by Turkish than by German mothers.

With regard to supernatural causes, we asked for the use of a talisman in both groups and for the influence of *nazar* and the consequence of not having said *maschalla* in the Turkish group. Eighteen percent of Turkish mothers stated that not having used a talisman could cause fever whereas none of the German mothers responded positively to this item (p=0.06). Forty-three percent of the Turkish mothers reported that having forgotten to say *maschalla* and *nazar* could cause fever.

Table III. Selected Causes of Fever and Their Appraisal by Turkish and German Mothers

Item		German	Turkish	Total	p-value
Infection	Yes	78% (21)	52% (12)	66% (33)	0.15
	No	18% (5)	35% (8)	26% (13)	
	Indifferent	4% (1)	13% (3)	8% (4)	
Virus	Yes	100% (27)	87% (20)	94% (47)	0.05
	No	0% (0)	13% (3)	6% (3)	
	Indifferent	0% (0)	0% (0)	0% (0)	
Familial Mediterranean fever	Yes	0% (0)	22% (5)	10% (5)	0.03
	No	26% (7)	30% (7)	28% (14)	
	Indifferent	74% (20)	48% (11)	62% (31)	
Insufficient warm clothing	Yes	33% (9)	39% (9)	36% (18)	0.88
	No	60% (16)	52% (12)	56% (28)	
	Indifferent	7% (4)	9% (2)	8% (4)	
Cold weather	Yes	22% (6)	52% (12)	36% (18)	0.09
	No	71% (19)	44% (10)	58% (29)	
	Indifferent	7% (2)	4% (3)	6% (3)	
Eating ice cream	Yes	4% (1)	26% (6)	14% (7)	0.02
	No	96% (26)	74% (17)	86% (43)	
	Indifferent	0% (0)	0% (0)	0% (0)	
Walking barefoot	Yes	11% (3)	44% (10)	26% (13)	0.01
	No	89% (24)	56% (13)	74% (37)	
	Indifferent	0% (0)	0% (0)	0% (0)	
Stress in kindergarten or school	Yes	30% (8)	22% (5)	26% (13)	0.40
	No	56% (15)	48% (11)	52% (26)	
	Indifferent	15% (4)	30% (7)	22% (11)	
Argument in family	Yes	22% (6)	9% (2)	16% (8)	0.43
	No	9% (7)	78% (18)	72% (36)	
	Indifferent	16% (8)	13% (3)	12% (6)	
Forgetting to attach talisman	Yes	0% (0)	18% (4)	8% (4)	0.06
	No	93% (25)	73% (16)	73% (16)	
	Indifferent	7% (2)	9% (2)	8% (4)	

Twenty-two percent of Turkish mothers knew familial Mediterranean fever as a cause versus none of the German mothers (p=0.02). No differences were found in the items "infection", "virus" and "cold weather".

Fever-related concerns

As fever is often related to other symptoms and conditions, we asked for factors that can cause severe concern. For 96% of the German mothers, a high temperature itself was a reason to worry, whereas this was only the case for 83% of the Turkish mothers (ns). At the same time, Turkish mothers stated more often that they are always worried when their child has fever (65% vs. 30%). Chills and fantasizing caused concern more in Turkish mothers than in Germans (91% vs. 63%, p=0.01 and 96% vs. 83%, ns).

Interpretation of fever

In order to further elicit the concepts associated with fever, we offered several statements that represented the following interpretations of fever:

- fever reflects a normal defense reaction of the body
- fever is important for the healthy development of a child
- reducing fever can avoid the progress of a disease
- antibiotics are the safest treatment for fever
- in fever, the child primarily needs rest and care

Fifty-one percent of the Turkish mothers found that reducing fever can avoid a serious disease,

whereas only 18% of the German mothers shared this opinion (p=0.01). In contrast, 78% of the German mothers stated that the body can "deal with the germs itself" and 65% of the Turkish mothers agreed with this view (ns). Both groups agreed on the view that a child needs rest and care and that fever is a normal event in childhood. With regard to the use of antibiotics as a safe strategy to treat fever, we found only a minor difference between the two groups.

Measures taken against fever

This group of items comprised strategies to modify body temperature (antipyretics, sponging, warmth supply), loving care (snuggling), supportive actions (offering fluids, staying at home), use of medication, and religious and ritual practices (praying).

Interestingly, 37% of the German interviewees gave their child warm clothing, while only 13% of the Turkish mothers did so (p=0.05). They also stated that warm blankets were used in 37% and 17% of the cases, respectively (p=0.12). In contrast, Turkish mothers used strategies to lower the temperature more frequently than German mothers. Wearing of light clothing (91% vs. 70%, p=0.07), antipyretic suppositories (93% vs. 83%, ns), the use of cool wraps (83% vs. 74%, ns), sponging with vinegar (35% vs. 4%, p<0.01), and cool baths (30% vs. 0%, p<0.01) seemed to be strategies preferably used by Turkish mothers. Loving care was queried with the items "snuggling", "sleeping in the parents' bed", and "fulfilling the child's wishes". Here, we found that German mothers answered positively more often than the Turkish (snuggling: 93% vs. 83%, p=0.11; sleeping in parents' bed: 82% vs. 65%, p=0.19; and fulfilling the child's wishes: 85% vs. 65%, p=0.10).

We found no significant difference with regard to the supportive actions. The use of antibiotics was reported more often by German mothers (48% vs. 39%, ns). Only homeopathic and naturopathic medication was administered more often by the German than the Turkish mothers (82% vs. 30%, p<0.01; 74% vs. 70%, p=0.72).

Furthermore, we found a significant difference in the use of religious and ritual practices. Eighty-three percent of the Turkish mothers reported that they prayed when the child had fever compared to 4% in the German group (p<0.01). Furthermore, 26% used a *muska* (i.e. an amulet of extracts from the Koran) and 5% a *nazar boncuğu* (i.e. an amulet that protects against the evil eye). These two items were not queried in the German group.

Fever-related fears

Mothers were asked: "what have you feared when your child had fever?" Offered items included fits, brain damage, death, blindness, dehydration, development of a serious disease, confusion, and increasing temperature (not stoppable). Generally speaking, the German mothers seemed less concerned with regard to these very serious complications.

Familial context

Having a sick child often means a considerable degree of uncertainty and an emotional and physical burden for the mother and parents, respectively. We therefore asked questions to elicit the availability of familial resources, especially the grandparents of the child.

Physical distance: Overall, grandparents in German families lived in the same city more often than in the Turkish families. In the Turkish families, 35% of grandparents from the mother's side and 46% from the father's side lived abroad.

Personal support: German mothers more frequently reported support from the grandparents via taking care of the (other) children (82% vs. 48%, p=0.05).

Advice: Seventy percent of the Turkish mothers stated that advice they received from other family members when the child was ill made them insecure, whereas this was the case in only 23% of the German mothers (p<0.01). Twenty-two percent of the German mothers answered that their husband was the driving force in the decision to see a doctor, whereas this was the case in 52% of the Turkish mothers (p=0.02).

Translating: Twenty-nine percent of the Turkish mothers reported that they preferred to see a doctor with a family member who helps with translation. This question was not asked in the German group.

Subgroup analysis of Turkish mothers

The subgroup of Turkish mothers was heterogeneous with regard to the birthplace and country in which they grew up. This subgroup was small and the results of analysis therefore should be interpreted cautiously. However, we found differences in the interpretation of fever between mothers with a Turkish background who were born in Turkey as opposed to those born in Germany. The latter agreed more with the item "fever and diseases with fever are important for my child's development" (p=0.056) and agreed less with the statement "the safest way to treat fever is the use of antibiotics" (p=0.048). Comparisons between mothers who immigrated to Germany after their 18th birthday with mothers who immigrated earlier showed differences in the use of homeopathic medication. The latter group seemed to use homeopathic treatment more frequently (p=0.06). On the other hand, mothers immigrating after the age of 18 agreed more with the item "when my child has fever it requires loving care most" (p=0.019).

Reliability

Forty mothers were interviewed a second time. Ten did not agree to be interviewed again or could not be reached.

Table IV shows the Cohen's kappa for the items used to determine the causes of fever. Apart from the item "clothing not warm enough", all items showed moderate to almost perfect agreement (k>0.4) (Table IV).

Discussion

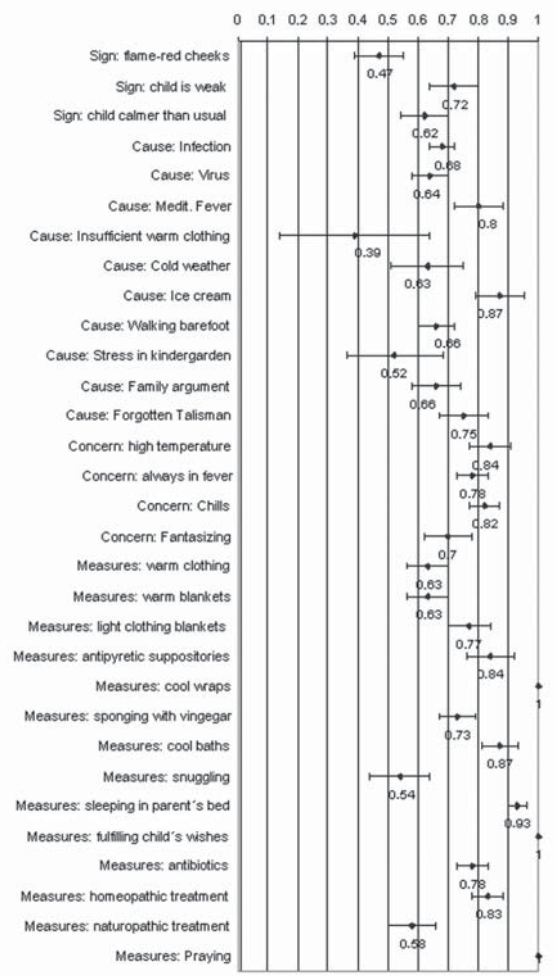
This pilot study was conducted to test the questionnaire, to determine its reliability and to develop hypotheses based on the results that will be tested in a larger study. Comprehensibility of the questions and items was found to be good in cognitive interviews, problem coding and by obtaining interviewer feedback.

The comparison between the first and the second interview showed at least a moderate reliability of items. We consider this to be sufficient, taking into account that lay perspectives on illness tend to change as they are influenced by personal and cultural factors[34].

The results showed several differences in explanations of fever and measures taken against fever between mothers with a German versus Turkish cultural background. Some of these were statistically significant. However, the two groups also showed significant differences with regard to age and socioeconomic background, and the sample size was too small for subgroup analysis. As these factors play a role in other studies, the differences in the fever concepts should be interpreted carefully in order to avoid cultural stereotyping.

In this study, we used the socioeconomic index by Winkler, which comprises the undergraduate educational level, the professional position and the average monthly income in order to allow comparisons with the results of the KIGGS Study. This was a large health survey

Table IV. Test-Retest Reliability of Items by Cohen's Kappa (Confidence Interval: 95%)



among children and adolescents conducted in Germany from 2003 to 2006 with a special emphasis on the situation of children with a migrant background. Whereas most studies about fever concepts used the educational level as a co-variable alone, the socioeconomic index does not differentiate between education, professional status and standard of living. It can be argued that an individual's knowledge about the human body and disease processes depends mostly on his/her educational level. However, from a perspective that puts more emphasis on the migratory experience, it can be argued that the socioeconomic index gives a better impression of an individual's status with regard to integration into the society and assimilation, which is important for health policy makers. Furthermore, the three factors show positive correlations in many cases, e.g. a person with a high educational level is more likely to have a high income and succeed in his/her professional life.

The subgroup of Turkish mothers was heterogeneous with regard to the place of birth and country in which they grew up. Analysis of this small group showed some significant differences in items. It seems plausible that the environment in which a person grows up plays an important role in the development of that individual's cultural background and thus in shaping a disease concept. However, an interpretation of an underlying fever concept on the basis of our data is difficult due to the size of the group. Analysis of a larger group is necessary.

In order to reach mothers from a wide background with regard to education and language skills, we used standardized face-to-face interviews in both German and Turkish. This proved to be reasonable as some mothers especially with Turkish background had only attended elementary school and probably had insufficient reading and writing skills to complete a questionnaire. However, one interviewer reported that for one mother it was difficult to prescind the child's health status at the time of the interview from illness episodes in the past. Furthermore, the use of Likert scales requires abstraction and transfer of abilities, which cannot be taken for granted in every lay person. We tried to respond to this phenomenon with the use of visual aids for the interviewees, which seemed to work well. However, face-to-face-interviews require attempts to control for interviewer influence. We therefore conducted an interviewer training with video feedback. Furthermore, the interviewers had regular exchange with each other about problems and experiences with the interviews.

To our knowledge, this is the first study to analyze fever concepts of German and Turkish mothers in Germany. Studies from other countries, e.g. the United States, the Netherlands and Italy, show an influence of the cultural background on the concepts of mothers as well. This pilot study consists of a small sample, and thus the results need to be interpreted with caution. A study with a larger sample is required to compare findings with previous studies in detail.

From the methodological point of view, a factor analysis might be helpful to classify single items with respect to underlying concepts and theories of fever. For this purpose, however, the sample size of the present pilot study is too small and thus the results can only be interpreted descriptively with caution.

For future studies, a larger sample is required to compare findings with previous studies in detail. It could be interesting, for example, to compare the Turkish mothers with a migrant background in Germany with autochthonous Turkish mothers in Turkey to explore the relevance of the migration experience in relation to the cultural background alone. For this, a validation of the questionnaire in Turkey would be necessary.

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