Mothers’ reports of infant crying and soothing in a multicultural population

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Abstract

Objectives—To investigate the prevalence of infant crying and maternal soothing techniques in relation to ethnic origin and other sociodemographic variables.

Design—A questionnaire survey among mothers of 2–3 month old infants registered at six child health clinics in Amsterdam, the Netherlands.

Subjects—A questionnaire on sociodemographic characteristics and crying behaviour was completed for 1826 of 2180 (84%) infants invited with their parents to visit the child health clinics. A questionnaire on soothing techniques was also filled out at home for 1142 (63%) of these infants.

Results—Overall prevalences of “crying for three or more hours/24 hour day”, “crying a lot”, and “difficult to comfort” were 7.6%, 14.0%, and 10.3%, respectively. Problematic infant crying was reported by 20.3% of the mothers. Of these infants, only 14% met all three inclusion criteria. Problematic crying occurred less frequently among girls, second and later born children, Surinamese infants, and breast fed infants. Many mothers used soothing techniques that could affect their infant’s health negatively. Shaking, slapping, and putting the baby to sleep in a prone position were more common among non-Dutch (especially Turkish) mothers than among Dutch mothers. Poorly educated mothers slapped their baby more often than highly educated mothers.

Conclusions—Mothers’ reports of infant crying and soothing varied sociodemographically. Much harm may be prevented by counselling parents (especially immigrants) on how and how not to respond to infant crying. Health education should start before the child’s birth, because certain soothing techniques could be fatal, even when practised for the first time. (Arch Dis Child 1998;79:312–317)

Keywords: infant crying; soothing; ethnic origin

In many countries, excessive crying in infants is a common phenomenon and probably one of the most difficult problems parents have to face. This might elicit soothing techniques that can be injurious to health, such as putting the baby to sleep in a prone position. In the Netherlands, the prevalence of excessive infant crying is unknown. In other Western countries it varies from 3% to 30% in the first four months of life, depending on the sampling design and the definition of excessive crying.\(^5\)\(^9\) A frequently used definition is crying for three or more hours/24 hour day.\(^7\)\(^9\)\(^9\) According to the most subjective definition, an infant cries excessively when the parents state that it cries a lot.\(^1\) Other definitions have accorded less importance to the actual amount of crying; other factors are stressed, such as unresponsiveness to soothing.\(^7\) In most studies, only one definition for excessive crying is used. To our knowledge, no study to date includes these three definitions of problematic infant crying.

Cultural factors might influence the amount of infant crying—for example, differences in patterns of feeding and care.\(^1\)\(^9\)\(^9\) Some studies report effects of care giving styles on the amount of crying.\(^9\) From this perspective, excessive crying can be regarded as a response to the (Western) care giving style. Cultural factors influence maternal soothing techniques too.\(^1\)\(^9\)

Information about cultural differences concerning the amount of crying and soothing techniques is based mainly on cross cultural comparisons. Little is known about differences between ethnic groups living in a multicultural society. We examined the prevalence of reported infant crying (using three different definitions) as well as reported maternal soothing techniques in relation to ethnic origin and other sociodemographic variables.

Subjects and methods

We conducted a survey during the routine sociomedical examinations of infants aged 2–3 months in six out of 21 child health clinics belonging to the Municipal Health Service of Amsterdam. The combined population of these six child health clinics is representative of all infants in Amsterdam with respect to sex, ethnic origin, and maternal educational level.

DATA COLLECTION

The study was conducted between January 1995 and December 1996. During this period, 2180 infants aged 2–3 months and their mothers were invited to visit the child health clinics at the addresses registered in the municipal population register. All residents of the city of Amsterdam are registered in the municipal population register. The nurses and physicians from the collaborating child health clinics filled out a questionnaire on sociodemographic characteristics and the child’s crying history. Interpreters were used if the mother did not speak Dutch; for non-Dutch speaking Turkish and Moroccan mothers a female interpreter was present during the sociomedical examination; for other ethnic groups the health centres
null
Table 3 Soothing techniques of mothers in response to infant crying (percentages)

<table>
<thead>
<tr>
<th>Soothing technique</th>
<th>Total (n = 1142)</th>
<th>Crying for ≥ 3 or more hours per 24 hour day (n = 81)</th>
<th>Crying a lot (n = 154)</th>
<th>Inconsolable crying (n = 130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking in bed</td>
<td>60</td>
<td>85</td>
<td>84</td>
<td>75</td>
</tr>
<tr>
<td>Holding and carrying</td>
<td>95</td>
<td>100</td>
<td>99</td>
<td>98</td>
</tr>
<tr>
<td>Buggy ride</td>
<td>14</td>
<td>28</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>Car ride</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Music</td>
<td>57</td>
<td>81</td>
<td>75</td>
<td>69</td>
</tr>
<tr>
<td>Rocking</td>
<td>58</td>
<td>80</td>
<td>78</td>
<td>74</td>
</tr>
<tr>
<td>Pacifier</td>
<td>94</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Bathe</td>
<td>22</td>
<td>38</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td>Massage</td>
<td>43</td>
<td>51</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Herbal tea</td>
<td>57</td>
<td>81</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td>Crying it out</td>
<td>45</td>
<td>68</td>
<td>65</td>
<td>53</td>
</tr>
<tr>
<td>Night bottle</td>
<td>7</td>
<td>15</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Swaddling</td>
<td>14</td>
<td>22</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Prone sleeping position</td>
<td>28</td>
<td>37</td>
<td>41</td>
<td>33</td>
</tr>
<tr>
<td>Stopping breast feeding</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Admonishing</td>
<td>24</td>
<td>39</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>Smothering</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Shaking</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Slapping</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Hypnotics and sedatives</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Painkillers</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Laxatives</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

and crying behaviours on the prevalence of various soothing techniques. A regression was carried out for each individual soothing technique. The results of these analyses are expressed as adjusted odds ratios. The level of significance used was p < 0.05.

Results

RESPONSE RATES

A questionnaire on sociodemographic characteristics and crying behaviours was filled out for 1826 infants (84%). No information is available for the remaining infants. For 1142 (63%) of the 1826 infants, a questionnaire about soothing techniques was returned as well. The mothers who did not return the questionnaire were more frequently of non-Dutch origin (p < 0.001) and more had a lower level of education (p < 0.001) and a first born child (p < 0.001). No differences in response rate were found for crying behaviour and other sociodemographic characteristics.

Table 4 Multivariate odds ratios of soothing techniques by sociodemographic factors and crying behaviour

<table>
<thead>
<tr>
<th>Soothing technique</th>
<th>Boy v girl</th>
<th>First v later born</th>
<th>Surinam v Dutch</th>
<th>Turkey v Dutch</th>
<th>Morocco v Dutch</th>
<th>Other country v Dutch</th>
<th>Poor v high education</th>
<th>Crying infant* v not crying infant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking in bed</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2.49</td>
</tr>
<tr>
<td>Holding and carrying</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.97</td>
</tr>
<tr>
<td>Buggy ride</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2.42</td>
</tr>
<tr>
<td>Car ride</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.99</td>
</tr>
<tr>
<td>Music</td>
<td>–</td>
<td>0.32</td>
<td>–</td>
<td>0.58</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2.30</td>
</tr>
<tr>
<td>Rocking</td>
<td>(1.24)</td>
<td>1.34</td>
<td>–</td>
<td>3.94</td>
<td>0.56</td>
<td>0.64</td>
<td>0.56</td>
<td>1.76</td>
</tr>
<tr>
<td>Pacifier</td>
<td>1.42</td>
<td>1.39</td>
<td>–</td>
<td>0.49</td>
<td>(1.41)</td>
<td>(1.51)</td>
<td>–</td>
<td>1.97</td>
</tr>
<tr>
<td>Bathe</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2.05</td>
</tr>
<tr>
<td>Massage</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(1.34)</td>
</tr>
<tr>
<td>Herbal tea</td>
<td>1.31</td>
<td>1.45</td>
<td>0.55</td>
<td>(2.06)</td>
<td>–</td>
<td>(0.63)</td>
<td>–</td>
<td>1.61</td>
</tr>
<tr>
<td>Crying it out</td>
<td>–</td>
<td>(1.92)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.81</td>
</tr>
<tr>
<td>Night bottle</td>
<td>–</td>
<td>–</td>
<td>2.74</td>
<td>5.40</td>
<td>7.37</td>
<td>2.96</td>
<td>2.71</td>
<td>2.20</td>
</tr>
<tr>
<td>Swaddling</td>
<td>–</td>
<td>–</td>
<td>(0.46)</td>
<td>(2.56)</td>
<td>3.10</td>
<td>–</td>
<td>0.24</td>
<td>1.47</td>
</tr>
<tr>
<td>Prone sleeping position</td>
<td>0.75</td>
<td>2.61</td>
<td>3.93</td>
<td>1.90</td>
<td>1.55</td>
<td>–</td>
<td>–</td>
<td>2.05</td>
</tr>
<tr>
<td>Stopping breast feeding</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>4.45</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.84</td>
</tr>
<tr>
<td>Admonishing</td>
<td>(1.30)</td>
<td>1.71</td>
<td>–</td>
<td>6.36</td>
<td>(2.52)</td>
<td>4.32</td>
<td>–</td>
<td>1.87</td>
</tr>
<tr>
<td>Shaking</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>6.36</td>
<td>(2.52)</td>
<td>4.32</td>
<td>–</td>
<td>2.24</td>
</tr>
<tr>
<td>Slapping</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(2.71)</td>
<td>6.37</td>
<td>(3.26)</td>
<td>5.92</td>
<td>4.08</td>
</tr>
<tr>
<td>Laxatives</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(1.93)</td>
<td>–</td>
<td>–</td>
<td>3.02</td>
</tr>
</tbody>
</table>

Only odds ratios with p < 0.05 or p < 0.10 are presented; p < 0.10 for odds ratios in parentheses. No multivariate odds ratios were calculated for “smothering”, “hypnotics and sedatives”, and “painkillers”, because of empty cells in logistic regression model.

*According to at least one of the three definitions mentioned.

Crying behaviour

Table 1 presents the study sample according to sociodemographic characteristics and reported crying behaviour. Overall prevalences of “crying for three or more hours/24 hour day”, “crying a lot”, and “difficult to comfort” were 7.6%, 14.0%, and 10.3%, respectively (table 1). Problematic infant crying, according to at least one criterion, was reported by 20.3% of the mothers. Of these crying infants, only 14% met all three inclusion criteria. Sex, parity, ethnic origin, and type of feeding were all related to crying behaviour (table 2). Perceived crying for three or more hours a day occurred less frequently in girls compared with boys, Surinamese infants compared with Dutch infants, and breast fed infants compared with formula or mixed fed infants. The same held true for infants whose mothers stated that their infant cries a lot. Furthermore, primiparous mothers stated more frequently that their infant cries a lot compared with multiparous mothers. Surinamese mothers reported less frequently that their infant was difficult to comfort compared with Dutch mothers.

SOOTHING TECHNIQUES

Mothers used various soothing techniques to calm their babies. In addition to harmless methods, mothers also used techniques that could affect the infant’s health negatively (table 3). Most soothing methods were related to sociodemographic variables (table 4). Reported slapping, shaking, and putting the baby to sleep in a prone position were more common among non-Dutch mothers than among Dutch mothers. This held true especially for Turkish mothers (OR = 0.36 for shaking; OR = 0.37 for slapping; and OR = 3.93 for prone sleeping position). Poorly educated mothers also reported slapping their baby more often than highly educated mothers (OR = 4.08). Moroc- can mothers rocked (0.56), held, and carried their baby less frequently than Dutch mothers in response to infant crying (OR = 0.24).
Discussion

This study shows that the overall prevalence of reported problematic crying in babies aged 2–3 months differs according to the definition used: 7.6% for crying for three or more hours/24 hour day, 14.0% for crying a lot, and 10.3% for inconsolable crying. Problematic infant crying according to one or more criteria was reported by 20.3% of the mothers. Many mothers used soothing techniques that could affect the infant’s health negatively. Mothers’ reports of infant crying and soothing varied sociodemographically. Excessive crying was less common among girls, breast fed infants, and Surinamese infants. Soothing methods that can be injurious to infants’ health, such as slapping, shaking, and prone sleeping position, were more prevalent among non-Dutch mothers (especially Turkish) than among Dutch mothers.

Theoretically, a selective non-response among non-Dutch families might bias overall prevalences of crying babies. A selective high non-response among non-Dutch families is a common problem in surveys carried out in the multicultural cities of the Netherlands. However, in this study the non-response rate for the verbal questionnaire was very low, probably as a result of the reputation of the child health clinics, as well as the experience of the nurses and physicians at these clinics in contacting and interviewing respondents. Apart from this, a previous survey in these six child health centres showed that attendance rates vary little according to ethnic group.

A selective non-response was found for the mail questionnaire on soothing techniques. As a result, overall prevalences might be biased. Furthermore, the results might be biased by differences in socially desirable responses. For instance, it is possible that Dutch mothers slap and shake their children more often than they reported. It is also possible that “slapping” and “shaking” might have different meanings in different ethnic groups.

Of all problematic crying infants, only 14% met all three criteria. We find it remarkable that only 39% of the infants who cry a lot are also reported to cry for three or more hours/24 hour day. Conversely, of the infants who cry for three or more hours/24 hour day, 78% were also reported to cry a lot. Apparently, some parents cannot tolerate the least amount of crying, while others do not experience long crying periods as troublesome. Therefore, intervention efforts should be guided by parents’ perceptions of infant crying, irrespective of the actual amount of crying.

EXCESSIVE CRYING BY SOCIODEMOGRAPHIC CHARACTERISTICS

Different definitions of a crying infant lead to different conclusions about the sociodemographic factors associated with reported crying. For example, there was no association between parity and crying for three or more hours/day. This is in agreement with other studies. However, crying a lot was reported to be more common among infants of primiparous mothers. Perhaps primiparous mothers experience the same amount of crying as more troublesome. Furthermore, primiparous mothers were more likely to seek referral for infant crying than mothers of later born infants.

Reported excessive crying appeared to be more common in boys than in girls. Other studies reported no sex differences in the prevalence of excessive crying or mean amount of crying. However, most of these studies were based on small selective groups and data were sampled for purposes other than establishing sex differences in the amount of infant crying. One previous study found modestly increased crying in boys.

Reported excessive crying was more frequent among Dutch infants than among Surinamese infants. We found only two other studies in Western multicultural societies dealing with ethnic differences in excessive infant crying. In an Australian study, excessive crying was reported more commonly in infants with parents born in Lebanon, Asia, and South and Central America. A study in the USA among low birthweight infants showed that excessive crying was much less frequent among black infants than among white infants. This might reflect ethnic differences in genetic predisposition, care giving practice, or soothing techniques. Given that these studies were based on maternal reports, ethnic differences in maternal perceptions of crying might also be an explanation.

Poorly educated mothers did not differ from highly educated mothers in their reports of excessive crying. This is in accordance with other studies. In some studies, however, more crying was reported in higher socioeconomic groups or lower socioeconomic groups. These inconsistent findings can be explained partly by different indicators of socioeconomic status in different studies. Socioeconomic health differences in children vary strongly depending on the indicator of socioeconomic status.

Breast fed infants cried less than formula or mixed fed babies. This may not be related to the content of feeding. For instance, excessive infant crying is a common reason for mothers to switch from breastfeeding to bottle feeding. Furthermore, bottle fed infants might cry excessively because the child health clinic prescribes an insufficient amount of formula. Mongers
feeding, whereas breast fed babies can control the amount they feed. A Dutch study has shown that breast fed infants feed more frequently and/or were more frequently fed on demand than those who were bottle fed. These two factors are associated with a decrease in infant crying.\textsuperscript{16, 37}

**SOOTHING TECHNIQUES**

There is evidence that picking up and carrying,\textsuperscript{18-20} rocking,\textsuperscript{40} auditory stimulation,\textsuperscript{41} pacifiers,\textsuperscript{42-44} and herbal tea\textsuperscript{45} are effective soothers. Whether these techniques reduce crying in the long run is not known. In addition, some soothers that have been shown to be highly effective in experimental research are not perceived as such by mothers.\textsuperscript{46}

Some soothing methods must be strongly discouraged, because of their possible injurious effect on the child’s health. The most dangerous techniques a parent can use are to smother, slap, or shake the baby to make it quiet. Nonetheless, these techniques were reported by 2%, 3%, and 5% of mothers, respectively. Among mothers of infants with problematic crying, these prevalences were two to three times higher. Excessive crying has been identified as a major cause of child abuse,\textsuperscript{47} which could be fatal in infants, because of their inability to escape harm and their physical vulnerability to serious trauma.\textsuperscript{48}

Some studies suggest that ignoring a crying baby is effective in reducing the amount of crying.\textsuperscript{49, 50} Ignoring the infant's crying or leaving the infant alone when crying is a common response in Western societies.\textsuperscript{1, 51} In our study, 45% of mothers let the baby cry on at least one occasion. It is unclear how this behaviour affects the parent–child relationship. In a study dealing with the circumstances of 222 sudden unexpected deaths, five infants died in the night when the parents had let it continue to cry for the first time.\textsuperscript{52}

Crying in breast fed infants can be a symptom of allergy to cow’s milk products consumed by the mother. It is better to eliminate these products from the mother’s diet than to stop breastfeeding,\textsuperscript{53} which protects children from various diseases, especially infectious ones.\textsuperscript{54} Moreover, infants who had been switched to formula feeding were no more quiet than infants who were exclusively breast fed.\textsuperscript{55}

Swaddling (wrapping the baby in a blanket) appears to be soothing,\textsuperscript{56} but some forms of wrapping increase the risk of a congenital dislocation of the hip.\textsuperscript{57}

Laying infants prone to sleep increases the risk of cot death,\textsuperscript{58} so it is not acceptable to place the baby in this position to stop it crying. In a series of 108 sudden unexpected deaths, six infants died during their sleep when they were put to sleep in a prone position for the first time.\textsuperscript{59} In a series of 222 other sudden unexpected deaths this was the case with eight infants.\textsuperscript{60}

Some mothers assume that infant crying is caused by constipation, but the lack of evidence means laxatives should be discouraged. Hypnotics and sedatives should not be used because of a possible relation to brain damage and cot death.\textsuperscript{61}

**SOOTHING TECHNIQUES BY SOCIODEMOGRAPHIC CHARACTERISTICS**

Primiparous mothers were shown to admonish their baby more often in response to crying than multiparous mothers. Similarly, Boukydis and Burgess\textsuperscript{62} noted that first time parents respond to crying with greater arousal and more irritation than multiparous parents.

It is notable that Turkish and Moroccan mothers relatively frequently admonished, slapped, and shook their infant in response to crying. Perhaps punishment is a common child rearing practice with young children in those cultural groups. In a study of bed wetting in Amsterdam, relatively more Dutch parents praised their toddlers for a dry night, while relatively more immigrant parents punished their toddlers for a wet night.\textsuperscript{63}

Many Turkish mothers placed their baby to sleep in the prone position in response to crying. This is probably one reason why, in the Netherlands, Turkish infants are almost twice as likely to suffer cot death than Dutch infants.\textsuperscript{64} It is possible that the more frequent use of slapping and shaking among Turkish mothers also contributes to this higher risk.\textsuperscript{65}

**IMPLICATIONS**

Much harm may be prevented by counselling parents (especially immigrants) on how and how not to respond to infant crying. It is important to identify inappropriate parental responses and to suggest alternatives. Furthermore, it is practical to ask parents whether they detect differences in the effectiveness of their soothing methods, because effective soothing strategies differ for each child.\textsuperscript{66} Health education should start before the child’s birth, because some soothing techniques can be fatal, even when practised for the first time, such as the prone sleeping position, allowing the baby to continue to cry, smothering, and shaking.

Infant crying and soothing in a multicultural population


19 Roper A, Saenz AM, Michelson K. Amount and perception of baby crying in Finland and Colombia. Early Child Care Dev 1990;65:13–44.


