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Abstract

Purpose

The purpose of this study was to clarify the nature of mother's distress and its related factors resulting from the crying of her one-month-old infant.

Subjects and Methods

The subjects were mothers who delivered children in hospitals/maternity clinics in the Hokuriku district and who gave consent to our survey at the time of health examinations for one-month-old infants. The contents of the questionnaire were: characteristics of the infant's crying, states of mother's sleep, feeding and receiving support related to her distress about her infant and its associated factors. Scores were obtained using a 4-point Likert scale.

Results

Effective responses were obtained from 630 mothers, who consisted of 298 primiparas (47.3%) and 332 multiparas (52.7%). About 50% of the mothers experienced distress because they felt at a loss when their infant cried and when the infant did not stop crying even when being held or lulled. New mothers who had no experience with infants were more likely to indicate distress. The distress was significantly associated with factors such as the way the infant cried and if the infant failed to fall asleep in a timely way. It also was associated with factors in the mother's life such as feeling burdened with childcare and lack of confidence in childcare.

Conclusion

In order to support mothers having a one-month-old infant, it is important to pay attention to the characteristics of infant's crying, states of mother's fatigue, mother's expression of depression, and to know how mother comprehends childcare and her infant's crying. For screening to be effective it must include both infant and mother factors.

Key words: one-month-old infants, crying, mother's feeling of distress, childcare

I. Introduction

Japan's birth rate began decreasing in 1975. The total fertility rate in 2005 was 1.25/1000 and the average family size was 2.68. The nuclear family occupies about 60% of all the families (Health and Welfare Statistics Association, 2006). The downward trend of small family size poses some special problems for new mothers. Having no relatives or close friends who are

raising infants, first time mothers have no role models nor comfortable social resources through which they could gain valuable experience with infants. Gaining advice about coping with their crying infant may not be possible. Previous studies suggested that the mothers' feelings of distress and anxiety about childcare increased when they cannot appropriately cope with their crying infants (Kawai et al.; 1994, 1995, 1996, 1997, 1998). There is a possibility that the increase in distress

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and anxiety may prevent appropriate childcare behavior leading to dysfunction and harmful patterns in relating to their child.

As early as the 1960s infants' crying has been tape recorded and phonetically analyzed to determine the various types of crying (Kono, 1972; Niki, 1973; Wasz-Hockert, O., et al., 1968) as well as to clarify the characteristics of infants' cries associated with medical problems such as Down's syndrome and intrapartum asphyxia (Baba, 1994; Oi, 1977a, 1977b). However, studies by acoustic analysis using sound spectrograms mainly aim at the diagnosis of abnormalities. Though there have been studies on the identification of the meaning of cries (Wakita, 1994), mothers' coping behavior for their infant's crying (Kayashima, 1988), and studies to clarify factors associated with a mother's ability to discriminate among cries (Adachi, 1984) we have only qualitatively evaluated mothers' feelings toward and responses to their infants' crying (Tabuchi, 1999). Some mothers appeared to have adapted to the crying one month after birth, but others appeared to still have feelings of distress (Tabuchi et al., 1998). Therefore, we intended to evaluate the status of mothers' distress resulting from the crying of their one-month-old infants, and clarify the associated factors.

Definition of terms

In this study, the feeling of distress resulting from her crying infant refers to a stressful feeling resulting from the uncertainty, frustration and helplessness felt when her infant cries. Infant's rhythm refers to the pattern of waking, crying, feeding and sleeping.

II. Study methods

1. Design and Subjects

A descriptive, correlation design was used and data were collected through a non-probability sampling survey using a self-administered questionnaire. The subjects were mothers who delivered a normal infant in hospitals and maternity clinics in the Hokuriku district and gave consent to be surveyed at the time of the health examination for one-month-old infants.

2. Instrument

- 1) Self-report questionnaire
- 2) Questionnaire contents

The questionnaire contents were derived from several sources: (1) the results of a qualitative analysis of mothers' feelings about their infants' crying and related factors (Tabuchi, 1999; Tabuchi, et al., 1998, 2000), (2) the analysis of interviews of seven mothers of one-month-old infants revealed the mothers' feelings of distress such as irritation when their infants kept crying and failed to sleep or cried throughout the night, and when they had to cuddle their infant constantly because it would not stop crying and (3) a review of related literature (Hanasawa, 1992; Muller, 1994; Narama, et al., 1999). Reliability of the questionnaire, the number of items and expressions, were established after six maternity nursing researchers conducted a pre-test to eight mothers of one-month-old infant. The questionnaire was composed of the following three sections.

(1) Mother's distress resulting from crying infant

Each of the following four items was scored on a four-point Likert scale: "Often (Definitely agree)", 4 points; "Sometimes (Generally agree)", 3 points; "Rarely (Somewhat disagree)", 2 points; and "Never (Definitely disagree)", 1 point. The total score for the four items was calculated for the feeling of distress score (minimum-maximum, 4-16). The higher score indicated the more difficult the situation that the mothers experienced.

- ① "I am at a loss when my baby cries."
- ② "My baby does not stop crying even when being held."
- ③ "My baby does not stop crying even when being lulled."
- ④ "When my baby cries, I don't have my own method of stopping it".

(2) Factors possibly related with the feeling of distress

As possible factors related with mothers' feelings of distress, were 53 items sorted into 21 factors, including the nature of the infant's crying, the mother's sleep/feeding behavior, and the availability of support. Scoring was based on a four-point Likert scale so that the degree of distress expressed by mothers' subjective evaluation could be quantified.

(3) Basic information

Sixteen socio-demographic items that could influence the mother's perceived sense of distress were also collected. These were: mother's age, delivery experience, the gender of the infant, feeding method, family constellation, housing environment, state of employment, and experience of contact with infants or small children.

3) Survey procedure

The researchers sent a statement explaining the purpose and method of the survey to the hospital directors who had management responsibility for the outpatient maternity clinics in the Hokuriku region with 18 clinics giving consent. Next, the purpose of the study, the time required for answering the questionnaire and ethical considerations were explained verbally and in writing to mothers who brought their children to the health examination for one-month-old infants. Questionnaires were distributed directly to consenting mothers with instructions on how to complete and retain questionnaire anonymity. The questionnaires were collected either by staff immediately after being filled in or placed in a secure container and collected later in a batch.

3. Survey period

June-July, 2000.

4. Analysis methods

Data were analyzed using descriptive and inferential statistics. The distress score mean for all mothers was calculated. Subjects were classified by levels of distress using the mean ± 1 SD as a standard into high, average and low distress groups. Comparison between the three groups divided by attributes was conducted by a one-dimensional allocation distribution analysis. Comparison between two groups was conducted by a homoscedastic evaluation and followed by a t-test. For possible factors associated with the feeling of distress, Pearson's (or Spearman's) correlation coefficient was calculated, and step-wise multiple regression analysis was performed using factors showing significant correlations as independent variables and the feeling of distress score as a dependent variable. All analyses were

performed using SPSS for Windows 11.5.1J.

5. Ethical Considerations

We told mothers that their cooperation in this study would be voluntary, and guaranteed that they would not suffer loss of benefits in medical care or negative responses of medical staff irrespective of their participation or non-participation in the study. We also ensured participant's freedom to withdraw at any time. Anonymity of data and confidentiality were guaranteed. In addition, an explanation was given in writing that the obtained data would not be used for purposes other than research, and that we intended to report only the aggregated results of this study in scientific meetings.

III. Results

Of 763 distributed questionnaires, 654 (85.7%) were collected. There were 630 effective responses (82.6%). This survey was performed 32.4 ± 4.0 (mean \pm SD) days after delivery (range 21-60 days).

1. Characteristics of subjects

1) Mothers' delivery experiences and employment status

The mean age of the mothers was 29.2 ± 4.1 years (range 17-43 years old). There were 298 primiparas (47.3%) and 332 multiparas (52.7%). Concerning employment, 232 (36.8%) were taking maternity leave, 210 had not been employed (33.3%), 173 (27.5%) resigned from work after pregnancy, and 15 (2.4%) were working, while only 92 (14.6%) of all the subjects had ever had a job requiring contact with small children.

2) Infants gender and feeding methods

The gender of the infants was 318 males (50.5%) and 312 females (49.5%). The feeding method was breastfeeding for 258 infants (41.0%), mixed breast and formula feeding for 329 infants (52.2%), and formula feeding for 43 infants (6.8%).

3) Family constellation and dwelling

The family form was a nuclear family for 398 mothers (63.2%) and cohabitating with family were 226 mothers (35.9%). For delivery, 464 mothers (75.0%) went back to their parent's home. Among

the 154 mothers who did not go back to their parent's home, there were 44 primiparas (28.6%) and 110 multiparas (71.4%). The type of dwelling was a house for 390 mothers (62.0%) and apartment for 239 (38.0%).

2. Mothers' feelings of distress resulting from their infants' crying

Reliability of the four factors of mothers' distress resulting from their infants' crying was established by Cronbach's $\alpha=0.719$. Themes of distress related to crying of the 630 mothers are shown in Figure 1. Often/sometimes at a loss when their baby cries were 344 mothers (54.6%), 283 mothers (45.0%) responded that their baby often/sometimes does not stop crying even when being lulled, 243 mothers (38.6%) stated that their baby often/sometimes does not stop crying even when being held, and 90 mothers (14.3%) reported, when their baby cries, they definitely agree/generally

agree that they don't have their own method of stopping their baby cries. A majority of the mothers often/sometimes experienced distress or difficulty in coping with the baby's crying (Fig. 1).

The feeling of distress score was 4-15 (mean, 9.1 ± 2.4), and the most frequent score was eight, showing a normal distribution. According to the distress scores, the high distress group (12 points or more in total) had 104 mothers (16.5%); in the average distress group (7-11 points) were 446 mothers (70.8%); and in the low distress group (6 points or less) were 80 mothers (12.7%). There was a significance difference among the three groups, in terms of mother's delivery experiences and feeding methods. Mothers in the high distress group tended to be more primiparas than multiparas ($p<0.001$) (Fig. 2) and the proportion of mixed feeding was significantly higher ($p<0.001$) (Fig. 3).

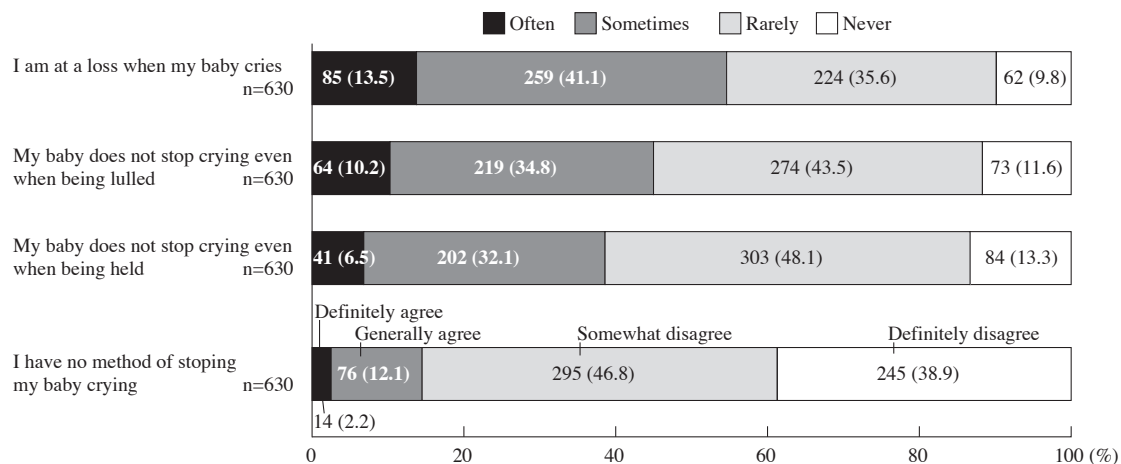
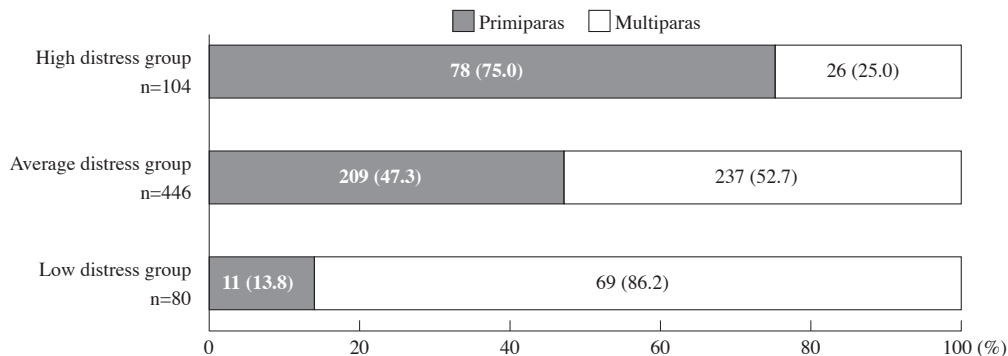


Fig. 1 Themes of distress related to crying



Significant difference was found among the three groups in terms of delivery experiences ($p<0.001$)

Fig. 2 Percentages of primiparas and multiparas in the distressed group

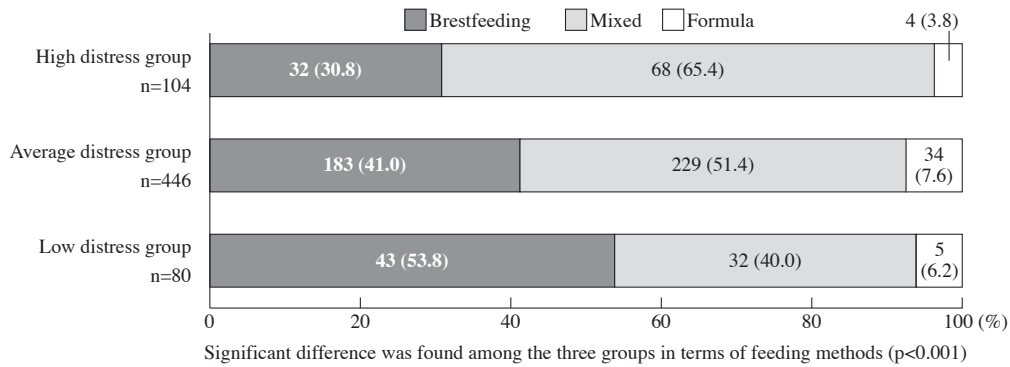


Fig. 3 Feeding methods according to group

1) Comparison of mother's feeling of distress according to attributes

There was significant difference in distress feelings in terms of mother's delivery experiences, employment status, occupational experience of contact with small children, whether or not they went back to their parent's home, and the feeding methods (see Table 1).

The feeling of distress score in primiparas and multiparas was 10.2±2.2 and 8.1±2.1 respectively. The score of primiparas was significantly higher. (p<0.001).

The feeling of distress scores were: mothers taking maternity leave (9.4±2.4), those who resigned from work after pregnancy (9.3±2.3), those who had not been employed (8.7±2.4), and those who currently worked (8.5±2.3). The scores of the mothers taking maternity leave were significantly higher (p<0.01) than the score

of those who had not been employed. The score was also significantly higher (p<0.01) in mothers without occupational experience of contact with small children (9.3±2.4) than in those with this experience (8.6±2.1). Mothers who went back to their parent's home scored significantly higher on the distress score (p<0.05) in (9.3±2.4) than those mothers who did not (8.7±2.3).

In terms of housing environment, the feeling of distress score was significantly higher (p<0.05) in mothers who lived in an apartment (9.4±2.3) than in those who lived in a house (8.9±2.4).

The relationship of feeding method to distress indicated that the feeling of distress score was significantly higher (p<0.001) in mothers using mixed feeding (9.4±2.4) than in those using formula (9.1±2.1) and breast feeding (8.7±2.2).

Table 1 Status of mother's feeling of distress according to attributes (N=630)

Attributes			Feeling of distress score mean±1SD	P
Delivery experience	Primiparas	n=298	10.2±2.2	0.000
	Multiparas	n=332	8.1±2.1	
Work	Originally no job	n=210	8.7±2.4	0.013
	Resignation after pregnancy	n=173	9.3±2.3	
	During maternity leave	n=232	9.4±2.4	
	Working	n= 15	8.5±2.3	
Occupational experience of contact with small children	Present	n= 92	8.6±2.1	0.008
	Absent	n=511	9.3±2.4	
Going back to parent's home	Present	n=464	9.3±2.4	0.010
	Absent	n=154	8.7±2.3	
Housing	House	n=390	8.9±2.4	0.023
	Apartment	n=239	9.4±2.3	
Feeding method	Breastfeeding	n=258	8.7±2.2	0.000
	Mixed feeding	n=329	9.4±2.4	
	Formula feeding	n= 43	9.1±2.1	

†: significant difference with Bonferroni correction

3. Factors associated with mothers' feelings of distress resulting from infant's crying

Reliability of the 53 related items of mothers' distress was established by Cronbach's $\alpha=0.873$. The infant-associated factors significantly correlated with the feeling of distress score were the infant's "state of falling asleep" (correlation coefficient $r=-0.542$, $p<0.001$), "characteristics of crying" ($r=0.531$, $p<0.001$). In other words the more easily the infants fell asleep, the less distress mothers felt; the more frequently the infants cried or the more difficulty in getting the infants to stop crying, the higher distress the mothers felt. The mother-associated factors most significantly correlated with the feeling of distress score were "childcare experience" (correlation coefficient $r=-0.410$, $p<0.001$). This means that when mothers had more experience with childcare they felt less distressed. The "feeling of being burdened with childcare" (correlation coefficient $r=0.622$, $p<0.001$), "prospect of childcare" ($r=-0.606$, $p<0.001$), and "confidence in childcare" ($r=-0.563$, $p<0.001$) also significantly correlated with the feeling of distress score. This indicates that the more mothers felt burdened with childcare, the more distress they felt, and when they felt more confidence with childcare, the mothers felt less distressed (Table 2).

As a result of multiple regression analysis of the

15 factors significantly associated with the feeling of distress score ($r<0.3$), 64.0% were explained by the following nine factors: "feeling of being burdened with childcare" ($\beta=0.101$, $p<0.001$), "confidence in childcare" ($\beta=-0.181$, $p<0.05$), "characteristics of crying" ($\beta=0.184$, $p<0.001$), "state of falling asleep" ($\beta=-0.175$, $p<0.001$), "childcare experience" ($\beta=-0.126$, $p<0.001$), "changes in crying after discharge" ($\beta=0.139$, $p<0.001$), "prospect of childcare" ($\beta=-0.132$, $p<0.001$), "infant's rhythm" ($\beta=-0.098$, $p<0.01$), and "coping with crying and worries" ($\beta=0.093$, $p<0.01$). This indicates that influencing the mothers' distress were such factors as the infant's difficulty in falling asleep, frequent crying, changes in crying after discharge, infant's irregular rhythm, feeling of burdened with childcare, little confidence with childcare, little prospect of childcare, worried about how to cope with the infant's crying, and little experience with childcare. Among them "state of falling asleep" ($\beta=-0.281$, $p<0.001$), "characteristics of crying" ($\beta=0.287$, $p<0.001$), "changes in crying after discharge" ($\beta=0.242$, $p<0.001$), and "infant's rhythm" ($\beta=-0.158$, $p<0.001$) as child-associated factors explained 48.5% of all feelings of distress. The revised model of distressed feelings related to infants' crying obtained is depicted in Figure 4.

Table 2 Correlation of factors associated with maternal distress (N=630)

Factor		Correlation coefficient	p
The infant-associated factors	State of falling asleep	-0.542	0.000
	Characteristics of crying	0.531	0.000
	Changes in crying after discharge	0.497	0.000
	Infant's rhythm	-0.356	0.000
The mother-associated factors	Childcare experience	-0.410	0.000
	Mother's health condition	-0.328	0.000
	Feeling of being relaxed	-0.330	0.000
	Night feeding burden	0.331	0.000
	Satisfaction with sleep	-0.313	0.000
	Feeling of being burdened with childcare	0.622	0.000
	Prospect of childcare	-0.606	0.000
	Confidence in childcare	-0.563	0.000
	Coping with crying and worries	0.450	0.000
	Feeling toward changes in life	0.442	0.000
	Sense of fulfillment in childcare	-0.361	0.000

(Morita, 2002). There are no statistics to document the reason yet it is assumed that most primiparas went back to their parent's home because it was their first delivery, while many multiparas did not go back to their parent's home probably because they were used to delivery and had older children to care for. Because 71.4% of the mothers who did not go back to the parent's home were multiparas in this study, the low feeling of distress score in mothers who did not go back to their parent's home may have been because most of them were multiparas. On the contrary, most of the primiparas went back to their parent's home where presumably psychological and physical support was available from their family; it was of note to see they had even higher score in distress than mothers who remained in their own home.

According to Yoshinaga and Kishimoto (2007), the perceived stressor is different between primiparas and multiparas. There is also report that high stressed mothers who do not receive much social support are still highly stressed in a year (Araki et al. 2003), and there is a strong tendency for mothers to request support from those around her (Kobayashi, 2006). There is a need to investigate further how the quality of the grandmother's support and relationship among family members would affect the feeling of distress resulting from the infant's crying.

Mothers living in apartments, were significantly more anxious compared to mothers living in houses. Kawai, et al. (1996) said that there was significant correlation between a high score of distress and consideration for closely surrounding neighbors and neighbors in the same apartment building. In recent years, mothers having an infant possibly have become more sensitive with perceptions of the distress and reactions by the neighbors.

2. Factors increasing mothers' feelings of distress resulting from crying of their infant

The factors associated with mothers' feelings of distress resulting from crying of their infant consisted of both mother and infant associated factors. One month after birth, it was found that mothers had a high stress score when their infant: "did not have a rhythm

of "crying→feeding→sleeping→crying"; "did not easily fall asleep"; "awoke and cried soon after falling asleep"; "cried at a high pitch or frequently" or "did not stop crying once started". The inexperienced primiparas' high distress resulting from crying can be readily understood. In such a situation, mothers may be further perplexed with characteristic crying and crying states they did not expect and did not know how to manage, therefore stress accumulated. A previous study also indicated similar responses of: "I do not know what to do", "I become uncertain", "I want to cry" when mothers heard their one month old infant crying uncontrollably; significantly more primiparas had these reactions than multiparas (Tabuchi et al., 2000).

Hiramatsu et al., (2006) reported an association between the sleep and awake rhythm and the number of times the infant wakes up during the night and the mother's distress. Hotta and Yamaguchi (2005) indicated through a survey focused on mothers of six months old infants, that mothers suffered when their infant had "inconsistent behavior", "trouble getting to sleep", and "cried at a high pitch". They also noted a relationship between stress-related childcare and depressive tendency.

In terms of feeding methods, it was expected that the score of mothers using mixed feeding would be higher showing more distress. The characteristic of one month after birth is a stage of establishing breast feeding. Mothers using breast feeding only are not restricted by time schedule and mothers using formula only prepare the formula milk at a certain interval, the level of stress of both of them seems low but mothers who use mixed feeding had psychological anxiety whether or not the infant was sufficiently fed, had burden of breast feeding, and additional preparation of formula. Feeding at three-hour intervals is necessary and mothers should wake up and feed their infant during the night, and thus mothers' sleep tends to be insufficient. This can be supported by the correlations between the feeling of distress and "burden of night feeding" as well as "degree of mother's satisfaction with her sleep". Persistent insufficient sleep tended to induce a poor physical condition, fatigue, and a depressive mood, showing an association with the "mother's health condition".

These results were also consistent with those of previous studies that showed a close association between the mother's health condition and lack of emotions (Tabuchi et al., 2000) or associations between the mother's anxiety/depressive feeling and infant's frequent crying, difficulty in soothing the infant, and an infant who does not sleep so much (Kawai et al.; 1994, 1996).

In addition, this study shows that the more mothers felt "feeling of being burdened with childcare" and "could not imagine the prospect of childcare" developed higher distress scores. Such mothers may experience increase distress during childcare as they had accumulate stress.

Takahashi and Kirita (2006) confirmed that the crying sounds of infants stimulated mother's negative emotion and there was stress induced reaction such as higher blood pressure with mothers who get depressed and had anxiety feelings resulting from an infant's crying. They also pointed out that mothers who showed strong annoyance toward crying also had poor tolerance for crying.

As described above, both the infant-associated factors such as characteristics of crying, state of falling asleep and infant's rhythm, and the mother-associated factors such as childcare experience, burdens from night feeding, lack of confidence with childcare and feeling of being burdened with childcare increased mothers' feelings of distress.

3. Limitations and Future issues

This study was limited to the subjects in the Hokuriku region therefore it is difficult to generalize. Next, we need to consider enlarging and randomizing the sample size ensuring representativeness and comparing situations between regions. In addition, in order to cover all the distress items resulting from infant's crying, we will continue to increase the validity and reliability of the instrument and revise the model. There is also a need to clarify the mother's perception of the housing environment and its role in increasing the mothers' distress.

To evaluate support during this period, attention should be paid to factors associated with both the mother and infant. Understanding the characteristics

and life cycle of one month old infants, consideration should be given to the factors that increase distress clarified through the current study. By knowing how mothers understand crying behavior, it is important to provide close support so that mothers can perceive crying to be a healthy characteristic of their infant. In addition, interventions to ensure mothers' sleep for the maintenance of their health are necessary and a support system involving living situation and family members should be established. During the health examination for one-month-old infants, nurses must address each mother's state of fatigue and note her expression of depressive feelings in order to provide timely recognition of her situation. A screening system should be established toward that goal.

V. Conclusion

About 50% of the 630 mothers with a one-month-old infant experienced being at a loss or had difficulty in stopping their infant crying. The mothers with an infant who had difficulty getting to sleep, irregular wake-up behavior, frequent crying, could not stop crying once started and those mothers who had little experience with childcare tended to develop feelings of distress.

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生後1ヶ月児の泣きに対する母親の困難感と関連要因

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目 的

生後1ヶ月児の泣きに対する母親の困難感とその感情に関連する要因を明らかにすることを目的とした。

対象と方法

北陸地方の病産院にて出産し、1ヶ月健診時に調査の同意が得られた母親を対象に、自己記入式質問紙調査を実施した。調査内容は、児の泣きに対する母親の困難感と、その関連要因として、児の泣きの性質や母親の睡眠・授乳状況、サポート状況などの質問項目を設定し、各々4段階リカート尺度で点数化した。

結 果

有効回答は、初産婦298名(47.3%)、経産婦332名(52.7%)、合計630名であった。全体の約半数の母親が、児が泣くと戸惑ったり、抱いたり、あやしても泣きやまない困難な状況を経験していた。困難感を示した母親は、小さな子どもと接したことのない初産婦に多く、子どもの泣き方が特徴的であったり、なかなか寝入らないなど、子ども側の要因と母親の生活状況、育児に対する負担感や自信感等の母親側の要因が困難感に関連していた。

結 論

生後1ヶ月時の母児の支援には、児側の要因と母親側の要因の双方に着目し、児の泣きの特徴や、母親の疲労状態、育児に対する気持ち等に注意を向け、母親が児の泣きをどのようにとらえているのかを知ることが重要であり、これらのスクリーニングの必要性が示唆された。

キーワード：生後1ヶ月、泣き、母親、困難感、育児