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[原著]

# Association of Mother–Child Interactions and Play with Maternal Parenting Stress

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**Summary**

This study sought to clarify the relationship between parenting stress among mothers raising infants and the frequency of and feelings about interaction and play between mothers and their infants. A self-administered, anonymous questionnaire was distributed to primiparous mothers (of singleton children) at four facilities visited by healthy infants and their mothers (e.g., for infant health checkups or to take advantage of parent–child play spaces), with 106 responses selected for analysis. The contents of the survey consisted of subject background, frequency of interaction and play between mothers and their infants, the Parenting Stress Index Short Form (PSI-SF), and a "Feelings Toward the Baby Questionnaire." The results showed that mothers who felt the financial burden of childcare and felt that it was a nuisance to do anything at all had significantly lower frequencies of interaction and play, and the frequency of mother–child interaction and play was negatively correlated with maternal parenting stress. In addition, the anxiety that mothers felt about interaction and play with their infants was associated with parenting stress, and multiple regression analysis (stepwise method) revealed that a factor influencing parenting stress was the disconnect between mothers' perception of parenting and its reality. The results indicate an association of mother–child interaction and play with parenting stress.

**Keywords:** primiparous mother, parenting stress, interaction, play

## Introduction

Parenting stress is a negative emotion that arises from attempts to meet the demands of parenthood (1) and is considered to include emotional reactions such as parenting anxiety and a sense of difficulty in child rearing (2). In the final evaluation of Healthy Families 21, the aim of which was to "promote the peaceful emotional development of children and reduce anxiety around parenting," no improvement was reported in "the percentage of mothers who lack

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confidence in their parenting" and "the percentage of mothers able to spend time with their children in a relaxed mood." Healthy Families 21 (Phase 2) aims to realize a society in which all children can grow up healthy and happy, and has set "building local communities to watch over and nurture the healthy growth of children" as a fundamental challenge and "providing support for parents who find it difficult to raise their children" as a priority challenge (3). It is hoped that nursing care dealing with parenting stress will be enhanced to ensure the healthy upbringing of children as well as the physical and mental health of mothers.

Studies on parenting stress among mothers have investigated negative emotions and examined a variety of background factors. Although the characteristic features of these factors vary, associations with maternal factors, child factors, and environmental factors have been suggested. Maternal factors include lack of confidence in parenting (4), being young (5), being old (6), having a poor spousal relationship (7), being unprepared for child rearing (8), parenting while in poor postpartum physical condition (6, 9), being a primiparous mother (2), threats associated with the mother's loss of personal identity (10), and the mother's susceptibility to anxiety (7, 11). Child factors include being a difficult baby (2, 12), while environmental factors include inadequate support from personal contacts (5, 13, 14) and inadequate family finances (15). In addition, research on parenting stress has focused on interactions between children and their mothers. In their observations of parents and children in play-based settings, Noriuchi et al. reported that parents experiencing parenting difficulties were less likely to develop play activities tailored to their infant's object of interest (16). Shigemoto et al. have shown that a mother's sense of parenting difficulty is likely to be heightened by their own sense of immaturity as mothers (12). Mothers' ability to read and respond to their children's needs is likely to reduce maternal parenting stress, and it has been suggested that nursing interventions are needed to enhance mothers' ability to respond (17, 18). The effectiveness of touch-based caring (19), interaction (20), and play (16, 18, 21) has also been suggested.

The parenting stress of mothers raising infants has an extremely large influence on how they interact with their children and also has a major impact on their children's mental and physical development (22). As professionals, we would like to support mothers who are inexperienced with child-rearing to raise their children in a healthy manner, so that they will be able to enjoy interacting with their infants without anxiety or difficulty. Clarifying the relationship between parenting stress and the frequency of mother–child interaction and play will enable us to observe and assess play between mothers and infants in the context of parenting support, which in turn will assist in the consideration of measures to reduce parenting stress. Accordingly, in this study, we sought to clarify the relationship between parenting stress and the frequency of and feelings about mother–child interaction and play in order to obtain suggestions on how to reduce parenting stress among mothers raising infants.

**Purpose**

The purpose of this study was to

clarify the relationship between parenting stress among mothers raising infants and the frequency of and feelings about mother–child interaction and play.

## Definition of Terms

*Parenting stress*

We define parenting stress as negative emotions arising from attempts to meet the demands of parenthood (1). This definition is considered to include emotional reactions such as parenting anxiety and a sense of difficulty in child rearing (2).

*Interaction and play*

We define interaction and play as a reciprocal interaction between a mother and her infant in a shared setting that has a psychological effect on both mother and child.

## Research Methods

1. Survey Participants

The selection criteria were mothers raising infants (children under 12 months of age) with their first singleton child (multiple births were excluded). The target population consisted of four facilities in the Tokyo metropolitan area that provide infant health checkups, parent-child plazas, and other services for infants and mothers living in the area of the school city. Both mothers and children were assumed to have no serious health problems and to be able to interact and play with each other.

The correlation coefficient between the frequency of various play activities for mother and child at the four levels and the enjoyment of play for mother and child was calculated from the pretest data, and was found to be about 0.3.

With a correlation coefficient of 0.3, a significance level of 0.05, and a power of 0.8, the number of samples needed for a test of no correlation (two-tailed) was calculated to be 82. Considering that the collection rate of questionnaires in this study would be about 50%, we decided to distribute 164 questionnaires, double the number of 82 cases.

2. Survey Period

The survey was conducted from October 2019 through February 2020.

3. Survey Content

1) Participant background

Questions items covered the following information: mother's age, child's age (months), problems encountered during pregnancy or delivery, destination after discharge from hospital, difficulties encountered in child rearing, distress related to the child's growth and development, the mother's physical condition, availability of people to ask for parenting advice, availability of person providing support with parenting and household chores, whether or not the pregnancy was planned, past experience of caring for an infant, availability of professional parenting consultations, the disconnect between the perception and reality of child rearing, and the sense of financial burden, information destination for play knowledge. The contents of the questionnaire were validated with reference to previous studies, under the supervision of a maternal nursing specialist.

2) Mother-child interaction and play

The frequency of 16 types of interaction and play was obtained using a 4-point Likert scale ("Never," "Not very often," "Sometimes," and "Often"). The feelings of interaction and play were sought in terms of the degree of enjoyment of interacting and playing with the infant and the degree of anxiety about whether this was the right thing to

do. Respondents were asked to use a 4-point scale to indicate their degree of enjoyment derived from interaction and play (“Not at all,” “Not very much,” “A little,” and “Very much”) and the degree to which they experienced uncertainty or uneasiness about interaction and play (“Not at all,” “Not much,” “Sometimes,” and “Often”). These responses were converted to numerical scores on a scale of 1 to 4. The 16 types of interaction and play were formulated with reference to previous studies (21, 23) and books (24, 25), and efforts were taken to validate the questionnaire, under the supervision of a maternal nursing specialist.

3) Maternal parenting stress

We employed the Parenting Stress Index Short Form (PSI-SF), using the Japanese version developed by SACCESS BELL. The PSI-SF uses a 5-point Likert scale (1 to 5), ranging from “completely disagree” to “completely agree,” that yields a total score as well as scores for “stress related to mothers’ own factors” (10 items) and “stress related to children’s factors” (9 items) calculated by summing the applicable items. A higher score indicates a higher level of parenting stress. The Cronbach's alpha coefficient for PSI-SF of Araki et al. is 0.82, which is reliable and valid (26).

4) The Mother–Infant Bonding Questionnaire

Originally formulated by M. N. Marks of the Section of Perinatal Psychiatry, Institute of Psychiatry, King’s College London, this questionnaire was based on the original proposal by C. Kumar and translated into Japanese by K. Yoshida. The Japanese version of the Mother-to-Infant Bonding Scale (MIBS-J) consists of ten items on a four-point Likert scale from 0 (“not at all”) to 3 (“very much”) for a total score ranging from 0 to 30, with 0 indicating positive feelings and higher scores indicating more negative feelings toward the baby. Although there is no cutoff value, the questionnaire is designed so that for a total score of 3 or more, the person administering the questionnaire listens attentively and specifically to respondents’ feelings about parenting with regard to the items for which a non-zero score was given. The questionnaire includes "I feel loving towards my baby" and "I feel nothing of my baby" (27). Confirmatory factor analysis indicated a two-factor structure among the eight items, and Cronbach's alpha coefficients were 0.71 and 0.57, indicating reliability and validity (28).

4. Survey Methods

Among community facilities that mothers and infants visit for services such as infant health checkups and parent–child play spaces, cooperation to take part in the study was obtained from four facilities: a health center offering infant health checkups in City A, a pediatric clinic offering infant health checkups in City B, a parent–child play space hosted by a child and family support center in City C, and a child-rearing salon in City D. The questionnaire was prepared with the cooperation of research partners. Copies of the questionnaire were distributed in person by a researcher at designated locations in the participating facilities. The questionnaires were collected by postal mail, with participants voluntarily dropping their questionnaires into the mailbox upon completion.

5.Method of Analysis

The relationship between parenting stress and the frequency of and feelings about mother–child interaction and play was analyzed using Spearman’s rank correlation coefficient. To examine the factors influencing

parenting stress, multiple regression analysis was conducted, with the total score of parenting stress as the objective variable and other factors as explanatory variables. Since the population was different in age from the previous literature, a stepwise method was chosen because it was not possible to be certain that the same items were stressing the same population. In addition, a *t*-test was used to compare the frequency of interaction and play with reference to the mothers' backgrounds. Statistical analysis was performed using IBM SPSS (Ver. 24).

6.Ethical Considerations

This study was approved by the Mejiro University Ethics Review Board for Research Involving Humans and Animal Subjects (No. 19 KEN-010, June 27, 2019). The participating facilities and research participants were fully informed in writing about the purpose of the research, the voluntary nature of research cooperation, their freedom to withdraw consent, the protection of privacy and anonymity, and the strict management of data. Those who gave their consent were included as research participants. The Japanese version of the PSI-SF was licensed for use by SACCESS BELL for a fee. The Japanese version of the Feelings for Babies Questionnaire was used with permission from the translator.

There are no relevant conflicts of interest to disclose for this paper.

## Results

At the four participating facilities, questionnaires were distributed to 164 primiparous mothers; valid responses were obtained from 106 (response rate of 64.6%) and used for analysis.

1. Participant Background

The characteristics of the participants are listed in Table 1. The mean age of the participating mothers was 32.3 ± 4.8 years and that of the infants was 4.7 ± 2.3 months. Thirty-seven (34.9%) mothers had problems during pregnancy or delivery. Fifty-seven (53.8%) mothers went to stay at their parents' home after being discharged from the hospital, while 47 (44.3%) returned to one's home. Eighty-one (76.4%) had child care difficulties and 25 (23.6%) did not. 32 (30.2%) had problems with their children's growth and development, and 74 (69.8%) did not. 83 (78.3%) of the mothers had physical problems and 23 (21.7%) did not. 106 (100.0%) of the mothers had a child care advisor and 0 (0.0%) did not have one. 105 (99.1%) of the respondents had a support person for child care chores, and 1 (0.9%) did not. Ninety-nine (93.4%) indicated that they had planned their pregnancies, while seven (6.6%) had not. Thirty-nine (36.8%) had some parenting experience and sixty-seven (63.2%) had none. Twenty respondents (18.9%) had consulted with a specialist about parenting, while eighty-five (80.2%) had not, and one respondent (0.9%) did not answer this question. Fifty-eight respondents (54.7%) felt that there was a disconnect between their perception of parenting and their actual experience, while 48 (45.3%) did not. Fifty (47.2%) respondents felt burdened by their financial situation, while the remaining fifty-six (52.8%) did not (Table 1). As sources of information on their mothers' knowledge of play, 42 (39.6%) of the mothers said their own parents, 40 (37.7%) said websites, 37 (34.9%) said books, 36 (34.0%) said past experiences, 25 (23.6%) said SNS, 17 (16.0%) said friends, 16 (15.1%) said TV, and 66 (62.4%) said other sources (Table 2).

2. Correlations with maternal parenting

Table 1: Participant background

n=106

| Item | | n | (%) |
|---|---|---|---|
| Mother's age | Mean±SD | 32.3±4.8 | |
| | ≤34 years old | 70 | (66.0) |
| | ≥35 years old | 32 | (30.2) |
| | NA | 4 | (3.8) |
| Child's age (months) | Mean±SD | 4.7±2.3 | |
| | ≤4 months | 74 | (69.8) |
| | ≥5 months | 32 | (30.2) |
| Problems encountered during pregnancy or delivery | Yes | 37 | (34.9) |
| | No | 69 | (65.1) |
| | Details of any problems (e.g., hyperemesis gravidarum, threatened premature delivery, emergency caesarean section) | | |
| Destination after discharge from hospital | Parents' house | 57 | (53.8) |
| | Own house | 47 | (44.3) |
| | Parents-in-law's house | 2 | (1.9) |
| Parenting distress | Yes | 81 | (76.4) |
| | No | 25 | (23.6) |
| Growth and development concerns | Yes | 32 | (30.2) |
| | No | 74 | (69.8) |
| Mother's physical condition | Yes | 83 | (78.3) |
| | No | 23 | (21.7) |
| Person from whom to seek parenting advice | Yes | 106 | (100.0) |
| | No | 0 | (0.0) |
| Person providing support with parenting and household chores | Yes | 105 | (99.1) |
| | No | 1 | (0.9) |
| Planned pregnancy | Yes | 99 | (93.4) |
| | No | 7 | (6.6) |
| Previous parenting experience | Yes | 39 | (36.8) |
| | No | 67 | (63.2) |
| Consultation with a specialist about parenting | Yes | 20 | (18.9) |
| | No | 85 | (80.2) |
| | N.A. | 1 | (0.9) |
| Disconnect between perception and reality of parenting | Yes | 58 | (54.7) |
| | No | 48 | (45.3) |
| Perception of parenting as a financial burden | Yes | 50 | (47.2) |
| | No | 56 | (52.8) |

N.A., not applicable

Table 2: Sources of knowledge about interacting and playing with infants (multiple responses)

n=106

| Item | n | (%) |
|---|---|---|
| Real Parents | 42 | (39.6) |
| WEB SITE | 40 | (37.7) |
| Books | 37 | (34.9) |
| Past experiences | 36 | (34.0) |
| SNS | 25 | (23.6) |
| TV | 16 | (15.1) |
| Friends | 17 | (16.0) |
| Public health nurse | 15 | (14.2) |
| Parent-child plaza/children's center | 13 | (12.3) |
| Childcare worker | 11 | (10.4) |
| Grandparents/parents-in-law | 6 | (5.7) |
| Midwife | 5 | (4.7) |
| Childcare support center | 2 | (1.9) |
| Other (siblings, husbands, events, educational DVDs, etc.) | 14 | (13.2) |

Table 3: Correlation coefficients between parenting stress and frequency of interaction and play

n=106

| Item | Frequency of interaction and play | Significance probability (two-tailed) |
|---|---|---|
| Total Parenting Stress Score | −0.341 | <0.001** |
| Child Factor Stress Score | −0.177 | 0.073 |
| Mother's Own Stress Score | −0.361 | <0.001** |

Spearman's rank correlation coefficient *$p$<.05 **$p$<.01

stress

The correlation between parenting stress and the frequency of interaction and play between mothers and infants was found to be negative with regard to the “mother’s own stress score” (ρ=−.361) (Table 3).

In terms of mothers’ feelings about interaction and play, negative correlations were found between mothers’ enjoyment and both the “child factor stress score” (ρ=−.265) and “mother’s own stress score” (ρ=−.377). In addition, significant positive correlations were also found between mothers’ feelings of anxiety and both the “child factor stress score” (ρ=.342) and “mother’s own stress score” (ρ=.457) (Table 4).

3. Feelings toward the Baby Questionnaire

The mean total score of the Feelings for Baby Questionnaire was 2.10 ± 2.58 (Table 5).

4. Factors influencing maternal parenting stress

Factors influencing parenting stress were examined using multiple regression analysis. Factors affecting parenting stress were positively associated with mothers’ experience of a disconnect between their perception of

Table 4: Correlation coefficients between parenting stress and mothers' feelings about play n=106

| Item | Enjoyment of interaction and play | Significance probability | Anxiety about interaction and play | Significance probability |
|---|---|---|---|---|
| Total Parenting Stress Score | −0.361 | <0.001** | 0.458 | <0.001** |
| Child Factor Stress Score | −0.265 | 0.007** | 0.342 | <0.001** |
| Mother's Own Stress Score | −0.377 | <0.001** | 0.457 | <0.001** |

Spearman's rank correlation coefficient *$p$<.05 **$p$<.01

Table 5: Total score of the Feelings toward Babies Questionnaire

n=106

| Item | | n | (%) |
|---|---|---|---|
| Total score of the Feelings for Baby Questionnaire | Mean±SD | 2.10±2.58 | |
| | 0 point | 31 | (29.2) |
| | 1 point | 22 | (20.8) |
| | 2 points | 19 | (17.9) |
| | 3 points or more | 33 | (31.1) |

Table 6: Multiple regression analysis with parenting stress as the objective variable

n=106

| Variables | Unstandardized coefficients | | Standardized coefficients | | | |
|---|---|---|---|---|---|---|
| | B | Standard Error | β | t-value | Significance probability | VIF |
| Distress in parenting (not feeling comfortable holding the baby) | 14.124 | 3.191 | 0.249 | 4.426 | <0.001 | 1.030 |
| Disconnect between the perception and reality of parenting | 4.439 | 1.393 | 0.197 | 3.186 | 0.002 | 1.251 |
| Interaction and play with the baby (holding the baby) | −5.132 | 1.875 | −0.158 | −2.737 | 0.007 | 1.091 |
| Interaction and play with the baby (play involving physical movement ) | −1.756 | 0.823 | −0.123 | −2.13 | 0.036 | 1.081 |
| Knowing that something must be done for the baby, but not knowing what | 4.619 | 1.103 | 0.255 | 4.186 | <0.001 | 1.208 |
| Feelings of exasperation or aversion toward the baby | 7.864 | 1.170 | 0.422 | 6.724 | <0.001 | 1.285 |
| Feeling very close to the baby | −11.176 | 1.954 | −0.326 | −5.721 | <0.001 | 1.057 |
| (Constant) | 18.694 | 2.439 | | 7.664 | <0.001 | |

*Degree-of-freedom adjusted coefficient of determination $R^2$=0.699

parenting and the reality (β=0.197), which was the background of the subjects. with the following problems with child care not feeling comfortable holding the baby (β=0.249), with the experience of knowing that something must be done for the baby but not knowing what (β=0.255), in the Feelings for the Baby Questionnaire. and with feelings of exasperation or aversion toward the baby (β=0.422). Negative associations were shown with respect to feeling very close to the baby (β=−0.326), in the Feelings for the Baby

Table 7: Effects of mothers' background on the frequency of interaction and play between mothers and infants n=106

| Item | | | Frequency | Mean | Standard error of the mean | Significance probability (two-tailed) | |
|---|---|---|---|---|---|---|---|
| Economic factors | Financial burden of parenting | Yes | 50 | 3.303 | 0.06 | 0.039 | * |
| | | No | 56 | 3.461 | 0.047 | | |
| Information source for knowledge about play | Past experience | Yes | 36 | 3.502 | 0.071 | 0.030 | * |
| | | No | 70 | 3.327 | 0.044 | | |
| | Television | Yes | 16 | 3.566 | 0.09 | 0.048 | * |
| | | No | 90 | 3.354 | 0.042 | | |
| Mother's physical condition | Feeling of nuisance | Yes | 8 | 3.102 | 0.111 | 0.034 | * |
| | | No | 97 | 3.411 | 0.04 | | |
| Parenting distress | Night-crying | Yes | 21 | 3.172 | 0.103 | 0.005 | ** |
| | | No | 85 | 3.439 | 0.039 | | |
| | Incessant crying | Yes | 13 | 3.081 | 0.138 | 0.003 | ** |
| | | No | 93 | 3.429 | 0.038 | | |
| Growth and development concerns | Baby not crawling | Yes | 4 | 2.917 | 0.057 | <0.001 | ** |
| | | No | 102 | 3.405 | 0.039 | | |
| Person from whom to seek parenting advice | Husband | Yes | 88 | 3.429 | 0.039 | 0.014 | * |
| | | No | 18 | 3.179 | 0.115 | | |
| | Parenting Support Center | Yes | 16 | 3.242 | 0.067 | 0.041 | * |
| | | No | 90 | 3.412 | 0.043 | | |
| | Child Consultation Center | Yes | 3 | 3.188 | 0.053 | 0.028 | * |
| | | No | 103 | 3.392 | 0.039 | | |
| Person providing support with parenting and household chores | Husband | Yes | 97 | 3.412 | 0.04 | 0.026 | * |
| | | No | 9 | 3.106 | 0.118 | | |
| | Father-in-law | Yes | 6 | 3.739 | 0.149 | 0.024 | * |
| | | No | 100 | 3.365 | 0.039 | | |

Studen's t-test *$p$<.05 **$p$<.01

Questionnaire. holding the baby during interaction and play (β=−0.158), and play involving physical movement in interaction and play with the baby (β=−0.123) (Table 6). The VIFs are all in the 1-point range, and the problem of multicollinearity is not considered to have occurred.

These seven items showed significant associations, with a constructed coefficient of determination (R-squared) of 0.699 for this model.

5. Effects of mothers' background on the frequency of interaction and play between mothers and infants

A *t*-test was used to check for differences in the effects of mothers' backgrounds on the frequency of interaction and play. This frequency was significantly lower among mothers who felt "the financial burden of parenting" (p=0.039) and those who felt that "it was a nuisance to do anything at all" (p=0.034). Interaction and play occurred with significantly higher frequency among those who obtained their knowledge of play from their "own past experiences" (p=0.030) and "television" (p=0.048).

Interaction and play occurred significantly less frequently among those who reported "night crying" (p=0.005) or

"incessant crying" (p=0.003) as sources of parenting distress or "not crawling" (p<0.001) as a growth and development concern.

The frequency of interaction and play was significantly higher among those who indicated their "husband" (p=0.014) as someone to ask for parenting advice or their "husband" (p=0.026) or "father-in-law" (p=0.024) as someone who provided support for parenting and household chores. In contrast, the frequency of interaction and play was significantly lower among those who cited "Parenting Support Centers" (*kosodate shien sentā*) (p=0.041) and "Child Consultation Centers" (*jidō sōdansho*) (p=0.028) in this regard (Table 7).

## Discussion

1. Attributes of the Subjects

The subjects were residents of a school city in the Tokyo metropolitan area. The subjects were mothers with their first infant (single fetus) who gathered at four of the facilities where infant health examinations, parent-child open spaces, etc. were conducted and who agreed to cooperate in the study. The mean age of the mothers was 32.3 ± 4.8 years. The average age of mothers at the time of delivery of their first child according to the Ministry of Health, Labor, and Welfare (2018) was 30.7 years (29), and the subjects in this study were slightly older in comparison. 53.8% of the mothers returned to their parents' home after discharge from the hospital, and 44.3% returned to their home. 63.2% reported no previous childcare experience. It can be inferred that a little less than half of the respondents are still fatigued after childbirth and have to deal with the unfamiliarity of childcare.

2. Associations between maternal parenting stress and the frequency of interaction and play

A significant negative correlation was observed between parenting stress and the frequency of mother–child interaction and play. Maehara et al. report that modern mothers are attempting to parent despite having little experience with babies, which is a factor contributing to parenting anxiety (20). This is due in part to the fact that is difficult for primiparous mothers to interact with infants who are unable to communicate with words. Mothers raising infants without ever having taken care of a baby and without knowing how to play require support and models about what play entails. Regarding the importance of early mother–child play, Toda states that infants can understand meaning and develop emotions based on various facial expressions on the part of the mother, while mothers can gain a deeper understanding and gain confidence as mothers through interactions with the baby (24). Furthermore, noting that maternal parenting stress is likely to be reduced when mothers are able to discern and react responsively to their children's needs, Maehara points to the need for nursing interventions that will enhance mothers' ability to respond (30). This suggests that parenting stress may be alleviated by providing support that increases the frequency of interaction and play. Specifically, we feel that making use of facilities such as a parent–child play spaces to implement interaction and play programs will be effective.

In terms of average mental health, it has been reported that mothers of infants are prone to stress (13), that heightened negative feelings about parenting affect mothers' level of

depression, and that mothers suffering from high levels of depression tend to be unresponsive and irritable in their parenting behavior (31). Noriuchi et al. report that parents experiencing a sense of difficulty in child rearing are less likely to develop play activities tailored to their infant's object of interest (16). When the frequency of interaction and play is reduced due to high levels of parenting stress, observation and assessment of instances of interaction and play between mothers and infants may lead to assessment of parenting stress.

3. Associations between parenting stress and mothers' feelings about interaction and play

In terms of mothers' feelings about interaction and play, parenting stress was found to be negatively correlated with enjoyment and positively correlated with anxiety. Mothers' feelings of anxiety about interaction and play suggest the relative lack of personal contacts that they can talk to about parenting, and it would be difficult to say that they enjoy being parents. Shigemoto et al. showed that these mothers' sense of parenting difficulty is likely to be heightened by their own sense of immaturity as mothers (12). Parenting stress is a negative reaction that arises from the attempt to adjust to the demands of parenthood (1). Mothers experiencing a sense of difficulty in child rearing have also been reported to be less likely to seek support from those around them (32). In terms of nursing care for mothers raising infants, it seems necessary to provide support not only for interaction and play but also for the mothers themselves. It is important to provide close support for mothers who are struggling or who are finding it difficult to raise their children as well as a living environment that involves community support, interactions among mothers, and local networks so that mothers who lack confidence in their parenting will be able to raise their children with peace of mind. Suzuki et al. report that in the process of gaining confidence in their role as mothers during the first four months postpartum, mothers gained a sense of security and assurance about parenting by viewing themselves objectively and comparing themselves through information gathered from professionals and friends experiencing motherhood in a similar environment (33). In an environment where mothers are able to talk with other mothers in a similar situation, we feel that it is necessary to support processes of trial and error in mothers' involvement with their children, and to provide interventions that encourage the mothers, helping them to find assurance that they are on the right track. If mothers receive encouragement from others that they are "doing all right," it seems they may be able to interact and play with their children more confidently and without feeling anxious. Maehara et al. reported "being satisfied with evaluative support" as a factor related to maternal role satisfaction in the first month postpartum among first-time mothers (34). It is our belief that primiparous mothers require the presence of others with whom they feel that can talk easily and from whom they can receive approval about their parenting decisions.

4. Factors affecting maternal parenting stress

Based on the results of multiple regression analysis, a factor influencing maternal parenting stress was a disconnect between mothers' perception of parenting and the reality. Maehara shows that those who experienced

difficulty with the shift to a baby-centered life had lower maternal role satisfaction (34). The psychological impact on mothers arising from this disconnect may make parenting more difficult. It was suggested that before the birth of the baby, the mother should be able to envision a life centered around the care of the baby after birth. In addition, “carrying” as a form of play by the infant and mother was associated with the parenting distress of “not feeling comfortable holding the baby.” For children, being held is an interaction from which they derive a sense of security. We feel that the interaction time spent holding the child, which is an important part of infancy, should not be something experienced as uncomfortable or painful by either party. Accordingly, thinking together with mothers about whether they are experiencing any difficulty in carrying their children, including with respect to their children’s physical characteristics, may be thought to lead to the alleviation of child-rearing stress. It was suggested that the act of carrying a child is a less stressful and important involvement in the upbringing of an infant child.

5. The influence of background factors on the frequency of mother–child interaction and play

We considered it necessary to clarify the wide range of factors that are expected to influence the frequency of interaction and play. In terms of maternal factors, mothers who felt “the financial burden of parenting” or that “it was a nuisance to do anything at all” engaged in interaction and play with significantly less frequency. Economic insecurity is also a factor contributing to parenting stress (35) and represents an urgent problem. Life circumstances vary widely, and thus nursing care that takes individual characteristics into account is needed. It is also important to collect information on such circumstances as early as possible, and to connect those in need of support with support in the wider community. The physical condition of mothers who "feel too lazy to do anything" can be attributed to a decline in physical fitness due to the trend toward late childbearing. Lack of sleep and a physically and mentally drained state are also factors contributing to childrearing stress (6). Tanaka also cautions against the risk of developing postpartum depression after childbirth, noting that fatigue, tearfulness, insomnia, and anxiety about childcare can easily be overlooked and interpreted as common postpartum physical ailments (36).

Encouraging mothers to rest and feel refreshed will necessitate social resources that can be easily accessed and a social environment that facilitates a partner-based approach to raising children.

In terms of child factors, interaction and play were significantly less frequent among mothers who were troubled by “night crying,” “incessant crying,” and their baby “not crawling.” Mothers distressed by “night crying” and “crying” are unable to devote attention to interaction and play with their children when they are physically and mentally drained from their desperate struggle to make the crying stop. Also, “not crawling” is a concern that relates to developmental delay. In Kanzaki’s study of mothers in their first month postpartum, having a “difficult baby” was one of the factors that contributed to the sense of difficulty in child rearing (2). Although “crying” and “putting the child to sleep” are often concerns from the early postpartum period onward (37), we

must also understand infants' developmental characteristics and provide support for dealing with "crying" and other concerns related to children's growth and development.

Horikoshi et al. report that mothers unable to cope with their children's crying were plagued with difficult feelings (5). "Night crying," which is a common problem during infancy, places a strain on mothers and tends to cause sleep deprivation, which in turn affects their physical and mental health. Frustration over incessant crying has also been reported as a possible motivation for abuse (38). How mothers view their children's "crying" has been reported as being linked to their sense of burden and difficulty in child rearing (39). It is necessary to pay attention to the characteristics of an infant's crying, the mother's state of fatigue, and her feelings about parenting as well as to support mothers in correctly understanding the growth and development of their infants.

In terms of environmental factors, mothers who regarded their "husbands" as a source of parenting advice enjoyed a higher frequency of interaction and play, while mothers who reported using "parenting support centers" or "child consultation centers" had a lower frequency of interaction and play. The inference here is that the greater relative reliance on the husband's support is due to the shift to nuclear families. Reasons for why husbands received a higher proportion of responses compared with the respondents' own mothers may be that their mothers are unavailable for support, either because they are too old or are still working, or possibly due to a generational divide in parenting. Kobayashi states that support from husbands is effective even when mothers experience difficulty controlling their stress levels, and notes that there is a need to increase the effectiveness of husbands' support due to the fact that the shift to nuclear families and the limited range of activities available to mothers with infants have tended to limit potential sources of support (40). Sakai et al. also reported that husbands, the mothers' own mothers, and friends all serve to alleviate maternal parenting stress (41). Husbands and the mothers' own mothers were also listed as sources of parenting advice and supporters in this study, indicating the importance of their presence and role.

It is possible utilization of professional guidance may indicate pre-existing difficulties in child rearing, which may have affected the frequency of mother–child interaction and play. This was suggested to be risk factors that reduce the frequency of interactions with the infant. Life circumstances vary widely, and thus nursing care that takes individual characteristics into account is needed. It is also necessary to collect information on such circumstances as early as possible, and to connect those in need of support with support in the wider community.

6. Implications for nursing interventions to reduce parenting stress from the perspective of mother–child interaction and play

In this study, we have examined associations between parenting stress and mother–child interaction and play with to the aim of reducing parenting stress among primiparous mothers. Our results demonstrated an association between parenting stress and the frequency of mother–child interaction and play. The results also suggested associations between parenting stress and anxiety about interaction and play.

Observing that mother–child interactions are largely dependent on the involvement of the mothers, Ueshima states that mothers' complaints of "not being able to relate well to their children" need to be taken seriously (42). For example, mother–child interaction and play programs during infant health checkups can provide opportunities for mothers who are experiencing parenting stress due to difficulties interacting with their children to learn how to enjoy interaction and play with their infants. We believe that an effective program would be one that (i) teaches mothers how to read signs from their children's reactions in settings involving interaction and play and to assign meaning to this interaction and (ii) helps mothers establish confidence in their interactions with their children in environments where they can talk with and receive encouragement from other mothers in similar situations.

A joyful, warm, and intimate relationship with the mother is fundamental to infancy, an important period that shapes the foundation for the child's future life as a social creature. We believe the way in which mothers perceive interaction and play with their infants has a strong impact on their relationship with their children. Accordingly, we believe that it is necessary to provide opportunities to convey to mothers in a broadly accessible manner the importance of their interactions with their infants as well as how to interact and play with their infants.

In addition, the results of this study also suggest that nursing care for mothers raising infant children should include not only support for interaction and play but also support for the mothers themselves. As in the case of anxiety over interaction and play, primiparous mothers are often unfamiliar with parenting and their feelings are likely to vary widely. In this study, many mothers were troubled by their infants' crying, and those mothers who felt a disconnect between their perception of parenting and the reality experienced parenting stress. For mothers to be able to raise their infants with peace of mind, it is necessary to provide support to mothers who lack confidence in child rearing. We believe that it is important to put in place a living environment that involves community support, interactions among mothers, and local networks. Furthermore, from a preventive perspective, this study revealed an association between parenting stress and the frequency of and feelings about mother–child interaction and play, suggesting that assessments can be used to identify mothers dealing with parenting stress so that support can provided at an early stage in order to alleviate parenting stress.

## Conclusion

This study examined the relationship between the frequency and thoughts of mothers' interaction and play with their infants and parental stress among mothers raising infants. The following conclusions were drawn from the results of 106 subjects at four facilities who were included in the analysis.

1. Since the "frequency" and "thoughts" of infant-mother interaction and play were found to be related to childrearing stress, observation and assessment of infant-mother interaction and play during childcare support may lead to assessment of childrearing stress.
2. Since an association was found between "frequency" of mothers'

interaction and play with their infants and child-rearing stress, it is possible that supporting mothers who have child-rearing stress due to difficulties in interacting with their children to increase the frequency of interaction and play will help reduce child-rearing stress.
3. The mothers' feelings of "enjoyment" and "anxiety" in interacting and playing with their infants were found to be associated with child-rearing stress. It was suggested that support for mothers raising infants is needed not only in terms of interaction and play itself, but also in terms of support for the mothers themselves.
4. Factors affecting mothers' parenting stress were influenced by the gap between the image of parenting and the reality of parenting. The psychological impact on mothers due to the gap may make child rearing difficult. It was suggested that it is necessary for mothers to be able to imagine a childcare-centered life for their baby after birth before giving birth.
5. In the examination of background factors influencing the frequency of play and interaction, the frequency of play and interaction was lower among mothers who reported "financial burden of childcare" and "poor physical condition" and those who reported "crying at night," "difficulty in stopping crying," and "not crawling" as their children's problems, while it was higher among mothers who were supported by their husbands. The frequency was higher in the group of mothers who had the support of their husbands. The mothers' life backgrounds vary widely, and nursing care that takes into account the individuality of each child is required.

**Limitations of this study and future issues**

The results obtained in this study are limited to four facilities, which limits their generalizability. In addition, the study period was prior to the impact of COVID-19, which limits its adaptation to the current coronary disaster for child care support.
In the future, we consider it a challenge to increase the number of subjects as well as to clarify parenting support in cases with health problems and in situations with current limitations.

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# 乳児と母親のふれあいや遊びと母親の育児ストレスとの関連

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**要 旨**

本研究の目的は、乳児を育てる母親の育児ストレスについて、乳児と母親のふれあいや遊びの頻度・思いとの関連を明らかにすることである。健康な乳児と母親が集う、乳児健康診査、親子ひろば等を実施する施設のうち、研究協力の承諾が得られた 4 か所において、第 1 子の乳児(単胎児)をもつ母親に無記名自記式質問紙調査を行い、106 名を分析対象とした。調査内容は、対象の背景、乳児と母親のふれあいや遊びの頻度、育児ストレスインデックスショートフォーム(PSI-SF)、赤ちゃんへの気持ち質問票とした。その結果、育児の経済的負担感や、何をするにも億劫に感じる母親は、ふれあいや遊びの頻度が統計的に有意に低く、乳児と母親のふれあいや遊びの頻度と母親の育児ストレスとの間に負の相関を認め、母親が乳児とのふれあいや遊びに不安を感じていることは育児ストレスと関連していた。また、重回帰分析(ステップワイズ法)の結果から、母親が子育てのイメージと現実との間にギャップを抱いていることが影響していた。

乳児と母親のふれあいや遊びと、育児ストレスには関連があることが明らかとなった。

**キーワード：**第 1 子の乳児を育てる母親　育児ストレス　ふれあいや遊び