Original Article

Reduction of Feelings of Insecurity about Pregnancy and Enhancement of Maternal-Fetal Attachment Through Perception of Fetal Movement During Dohsa-hou Relaxation

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The aim of the present study was to examine effects of establishing maternal antenatal attachment to the fetus through Dohsa-hou-induced positive mind-body experience. Pregnant women ($N=4$) underwent Dohsa-hou relaxation from 4 months of pregnancy to 2 weeks before birth. Each session took 60 minutes. Cognitive/affective responses to the fetal movements, image of the fetus as a human baby, emotional responses about becoming mother, and antenatal emotional attachment were assessed using the Maternal Antenatal Emotional Attachment Scale (MAEAS), and depressive states were assessed with the Self-Rating Depression Scale (SDS). In all participants, after Dohsa-hou relaxation sessions, there was a reduction in feelings of maternal insecurity, such as depressive and anxious feelings about pregnancy. Reduction was also seen in negative emotional responses to a past experience of abuse in one of the women who had experienced maltreatment. Over the course of the pregnancy, the occurrence of fetal movements increased during Dohsa-hou relaxation. The participants' perception of fetal movements was associated with enhanced attachment to their fetuses, as shown by increased scores on the Maternal Antenatal Emotional Attachment Scale.

Key Words: Dohsa-hou, reduction of maternal insecurity, fetal movements, maternal-fetal attachment, pregnant women

Introduction

Recently, because of an increasing number of reports of child abuse by caregivers, some method of tackling the problem of child abuse has become a matter of great urgency. According to an annual report of the Japanese Ministry of Health and Welfare (Ministry of Health, Labour and Welfare, 2007), more than 37,000 children were reported to have been maltreated by their caregivers in the year covered by that report.

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Research has shown that factors possibly contributing to a high risk of child abuse include having been maltreated, unwanted pregnancy, low socio-economic status, lack of social support, anxieties about pregnancy and delivery, maternal emotional instability, and having had a miscarriage. For example, Hart and McMahon (2006) found that higher levels of antenatal anxiety or depression were related to a less optimal maternal-fetal quality of attachment, and more negative attitudes towards motherhood and the self as mother.

During pregnancy, the mother's physical system is rapidly altered, adapting her body to fetal growth. As the same time, her self-image or self-identity expands to including becoming a mother. Especially during the first trimester of pregnancy (by the end of 15 weeks gestation), rapid changes in the woman's hormonal system may cause morning sickness, physical fatigue, such as stiff shoulders and back pain, and psychological instability, such as anxiety and depression. Pregnancy-related anxiety or depression in healthy pregnant women decreases by the end of the first trimester, and women reporting fetal movement at the beginning of the second trimester have been found to display higher maternal-fetal attachment scores (Reading, Cox, Sledmere, & Campbell, 1984).

According to Tsartsara and Johnson (2006), although women with a history of miscarriage revealed significantly higher pregnancy-specific anxiety in the first trimester, their anxiety had significantly decreased by the third trimester. Maternal-fetal attachment scores also rose significantly by the third trimester. The women in those studies who had had miscarriages reported a strong desire to have a baby, and their pregnancy was planned. Thus, it is possible that spontaneous decreases in pregnancy-related anxiety or depression may be attributable to women's positive attitudes towards pregnancy.

In contrast, as noted above, higher levels of antenatal anxiety or depression, especially for women with unplanned or unwanted pregnancies and women who have been abused, were related to a less optimal maternal-fetal quality of attachment, and more negative attitudes towards motherhood and the self as mother (Hart & McMahon, 2006).

Because of this, we decided to introduce an intervention that included Dohsa-hou relaxation, a psycho-educational program, and emotional support for the husbands of such women.

When a child is unwanted, there is a danger that the child may be rejected and deprived of emotional support. Relative risk factors associated with unwanted pregnancy include an unplanned pregnancy, poor marital relationship, unfavorable psychological climate in the family, low income, and problems with the mother's situation, such as being a student, or unmarried, or under the age of 19 (Safonova & Leparsky, 1998).

Research by Egeland, Jacobvitz, and Papatola (1987) and Zeanah and Zeanah (1989) indicated that 70% of parents who had reported having themselves been abused were abusing their children. According to Bowlby (1982), a child who receives reasonably sensitive and loving support and emotional availability from parental

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figures develops adequate self-esteem and confidence that important others will be available to provide necessary caregiving and support. In contrast, when a parent's caregiving is in some way less than adequate, the child develops deficiencies in feelings about the self and others, and has a variety of emotional reactions to the caregiving, especially anxiety and anger. Abused infants form a representation of their caregivers as unsupportive, unavailable, and rejecting, and of themselves as unworthy and unable to elicit appropriate attention and care from attachment figures. This early mental representation, that is, internal working model, is considered to be the prototype for future relationships, so that children who have not had the benefit of a secure attachment during childhood will be unable to form a secure relationship with their own children. Based on this process, child maltreatment may continue from one generation to the next (Ricks, 1985).

Attachment is an emotional tie or psychological bond to a specific object (Bretherton, 1985). The parental-fetal bond is a subjective feeling of love for the unborn child (Condon, 1993). Attachment behavior toward the fetus can include talking to the fetus, offering food when mother is eating, calling the fetus by a pet name, engaging the husband in conversations with the fetus, pushing the fetus around to watch the movement or so the husband could observe the movement (Leifer, 1977).

Maternal attachment to the baby starts from beginning of pregnancy. As the pregnancy progresses, the emotional ties between the mother and the fetus develop. During this time, mothers typically acquire an increasingly elaborated and complex internalized image of the fetus. Condon (1993) and Condon and Corkindale (1997) proposed two dimensions of antenatal emotional attachment, namely, the quality and quantity of the attachment pattern. The quality of the affective experience towards the fetus comprises experiences of closeness/distance, tenderness/irritation, positive/negative feelings, having a clear/vague mental picture of the child, having a concept of the fetus as a person/thing, and acknowledgment that the fetus depends on the mother for its well-being. The quantity or intensity of attachment, in contrast, refers to the mother's time spent thinking about the fetus and her interest in it. Mothers spend varying amounts of time talking to the fetus, gathering information about their fetus, dreaming, palpating, and picturing the fetus. This behavior results in a greater probability of mothers demonstrating proximity and information seeking, safeguarding the development and health of the fetus, while altruistically gratifying its needs.

Condon (1993) proposed a theoretical model of maternal antenatal attachment (MAEA) comprised of four antenatal attachment styles: a positive preoccupied pattern, a positive disinterested pattern, a negative preoccupied pattern, and a negative disinterested pattern.

The positive preoccupied pattern is shown by mothers who spend a great deal of time thinking about and palpating the fetus, accompanied by feelings of closeness and nurturance towards it. Positive disinterested mothers are also sufficiently attached, but spend less time in the attachment mode. The negative preoccupied pattern describes a mother who shows evidence of being in the attachment mode, but

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who is either affectless, or anxious about the fetus. The general quality of attachment to and perception of the fetus is negative. The negative disinterested mother shows little preoccupation with the fetus and is essentially uninvolved or emotionally negative towards it.

Pollock and Percy (1999) investigated whether maternal antenatal emotional attachment was associated with self-reported intent to harm the fetus. Interview data were used to determine the mothers' attachment style. Their results showed that negative preoccupied maternal antenatal emotional attachment was associated with an increased likelihood of reported irritation with the fetus. In contrast, secure women were strongly attached to the fetus from beginning of pregnancy, and reported seeking support and having positive mental health during the entire pregnancy (Mikulincer & Florian, 1999).

According to Heidrich and Cranley (1989), feeling fetal movements earlier in the pregnancy was positively related to attachment to the fetus. The prenatal attachment developed particularly after fetal movements were first felt. Zeanah, Carr, and Wolk (1990) found that mothers with higher levels of prenatal attachment perceived their unborn babies as moving more. As indicated by previous studies (e.g., Heidrich & Cranley, 1989; Reading et al., 1984), perceiving fetal movements in the first trimester of the gestation may enhance maternal attachment to the fetus, after which both the quality and the quantity of attachment increase over the course of the pregnancy.

Fetal movements are influenced by the mother's emotional state and physical condition. For example, a severe maternal emotional response to stress during the last trimester causes an immediate and profound increase in the activity level of the fetus. According to Sontag (1966), children of such mothers showed irritable and hyperactive characteristics. On the other hand, maternal physical fatigue decreases the number of perceptible fetal movements (Harris & Harris, 1946). The inhibitory effect of mother's fatigue has been attributed to an accumulation of toxins in the maternal blood stream (Schmeidler, 1941). However, when a pregnant woman is in a positive physical and psychological condition (i.e., relaxed state without physical fatigue, anxiety, or depression), fetal movements increase, and the mother perceives the movements as comfortable (Harris & Harris, 1946).

Because Dohsa-hou relaxation can reduce muscular tension and physical fatigue, and alleviate anxiety or depression (Konno & Yoshikawa, 2003; Konno & Yoshikawa, 2004), Dohsa-hou relaxation is considered to be an effective method for reducing maternal negative mind-body conditions and eliciting fetal movement, in turn enhancing maternal-fetal attachment.

In preliminary studies (Konno, 2001; Konno & Yoshikawa, 2005), the present authors found that Dohsa-hou relaxation could reduce negative conditions such as stiff shoulders and lower-back pain and improve antenatal depressive feelings and anxieties about pregnancy, while enhancing positive attitudes towards pregnancy. We also found that a positive mind-body experience using Dohsa-hou relaxation promoted fetal movement. The perception of fetal movement contributed to establishing antenatal maternal attachment to the fetus.

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The present study further explores effects of Dohsa-hou relaxation on reducing physical fatigue, alleviating depressive and anxious mood states, and enhancing positive attitudes towards pregnancy, including maternal-fetal attachment.

Method

Participants

The four pregnant women who participated in this study were referred to the present authors' Premarital and Marital Counseling Program on the Internet.

Participant A was a 32-year-old school teacher who had had two miscarriages, and had become nervous about the well-being of her fetus. Participant B was a 30-year-old student who was finding it difficult to accept her pregnancy because it was unplanned and unexpected. Participant C was a 37-year-old nursery school teacher who felt depressive because of her unplanned pregnancy. Participant D was a 23-year-old food server. Because in her childhood, she had experienced physical maltreatment by her mother and stepfather, she was afraid that she might harm the fetus.

In addition to those problems, all the participants had physical problems such as fatigue, stiff shoulders, and lower-back pain.

Wachter (2002) reported that greater dyadic satisfaction was significantly associated with having a balanced maternal-fetal attachment. In the present study, the women's partners were asked to participate. They understood the aims of the program, and cooperated with us in doing Dohsa-hou relaxation with their wives.

Content of Sessions

Each session took approximately 60 minutes, including the psycho-educational program and Dohsa-hou relaxation.

Psycho-educational program. The psycho-educational program included information and explanations about the following: (1) pregnancy-related stress responses and relaxation as an effective coping strategy, (2) adverse effects of anxiety and depression on maternal-fetal attachment, (3) adverse effects of past experiences of abuse on the establishment of maternal-fetal attachment, (4) perception of fetal movement and its enhancing effect on maternal-fetal attachment, (5) effect of husband's social support, including Dohsa-hou relaxation, on reducing pregnancy-related stress and establishing paternal-fetal attachment.

Dohsa-hou relaxation. Participants received Dohsa-hou relaxation from late in the first trimester or early in the second trimester of gestation to late in the third trimester. The method of Dohsa-hou relaxation used in the present study was Tokeai-Dohsa-hou ("Touch with a melting feeling"; Konno, 2005). "Touch with a melting feeling," one of the technique of Dohsa-hou, was especially developed for the purpose of establishing a positive bodily experience based on joint attention between the practitioner and the participant. This technique is also considered to be a universal design model of Dohsa-hou, in that it can be applied to anyone in need.

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With this technique, practitioners use their hand to touch the participant gently in areas such as the shoulders, the neck, the head, the back, and the foot. Next, they push gently for four to five seconds with their palm. The pressure is then slowly eased over five to six seconds, while the palm is kept in contact with the participant's body. While easing the pressure, the practitioner and the participant can share positive mind-body experiences such as a sense of warmth, a sense of stretching and moving the body, a relaxed mood, a sense of relief, and a sense of well-being. Based on these shared positive mind-body experiences, a therapeutic relationship or communication between the practitioner and the participant is enhanced. Then, both the practitioner and the participant can understand their positive aspects, while ignoring or neutralizing their negative aspects.

In the present study, Tokeai-Dohsa-hou was carried out on a one-to-one basis by a female practitioner. The criteria for relaxation using Tokeai-Dohsa-hou were as follows: (1) feel the shoulders becoming warm, (2) feel the shoulders stretching and becoming lighter, (3) feel the back moving smoothly and comfortably, (4) feel stretching at the ankle and the thigh, (5) feel the abdomen stretching and becoming warmer.

Measures

Fetal movement. In the present study, fetal movement was defined as a perception of the fetus moving inside its mother's abdomen. Also, verbal reports were obtained about the quality and quantity of the fetal movements that participants perceived, and their emotional response to the fetus during Dohsa-hou relaxation and in their daily life.

Maternal Antenatal Emotional Attachment Scales. The Maternal Antenatal Emotional Attachment Scales (MAEAS; Condon, 1993) was used to assess maternal attachment to the fetus. The Maternal Antenatal Emotional Attachment Scale was administered at the beginning of Dohsa-hou relaxation, in the middle of the second trimester, and late in the third trimester.

The Maternal Antenatal Emotional Attachment Scale consists of 19 items: (1) Sadness/mixed feelings towards fantasized fetal loss, (2) Positive/negative feelings towards the fetus, (3) Happy/sad feelings about the fetus, (4) Absence/presence of a desire to hurt or punish the fetus, (5) Anticipating positive/negative first impressions of the baby, (6) Feeling emotionally close to/distant from the fetus, (7) Desiring to hold the baby immediately/later, (8) Tender/irritable feelings towards the fetus, (9) Clear/vague mental picture of the fetus, (10) Concept of the fetus as a person/thing, (11) Dependency of the fetus on the mother for its well-being, (12) Frequently/infrequently thinking about the fetus, (13) Frequently/infrequently imagining the fetus, (14) Frequently/infrequently talking to the fetus, (15) Strongly/weakly desiring to read or get information about fetuses, (16) Strong/weak feelings accompanying thoughts of the fetus, (17) Frequently/infrequently dreaming about the fetus, (18) Frequently/infrequently palpating the fetus, and (19) Frequently/infrequently being concerned about the mother's diet.

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The Maternal Antenatal Emotional Attachment Scales consist of two underlying dimensions. The first dimension refers to affective experiences and positive feelings about the fetus (items 1 to 11); the second assessed the intensity of preoccupation with the fetus, such as the strength of feelings, and the amount of time spent thinking about or dreaming about the fetus (items 12 to 19). Participants respond on a 5-point scale; the higher values designate good antenatal attachment.

Self-Rating Depression Scale. The 20-item Japanese version of Zung's Self-Rating Depression Scale (Fukuda & Kobayashi, 1983) was used to assess maternal depressive states on a 4-point scale; with higher scores indicating more depressive. This scale was completed by the participants at the beginning of Dohsa-hou relaxation, in the middle of the second trimester, and late in the third trimester.

Results

Participant A

Progress of pregnancy. Dohsa-hou relaxation for Participant A was started at 14 weeks gestation in the first trimester of pregnancy. Because this woman had had two miscarriages, she felt nervous about her pregnancy and the well-being of the fetus. She had had stiff shoulders and lower-back pain for a long time. When she was troubled by those physical conditions, she was distressed by negative thoughts about the pregnancy. Physical distress also inhibited her from thinking positively about things. She also had ambivalent feelings about her pregnancy; that is, her feelings combined happiness from becoming a mother and anxieties about having a miscarriage.

Participant A and her husband had wanted to have a baby, but she had been very anxious about getting pregnant, because of having had two miscarriages. She

FIG. 1 Quality and Quantity Scores on the Maternal Antenatal Emotional Attachment Scale (MAEAS) Across the Progress of Pregnancy in Participant A

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often had bad dreams about miscarriage or losing an unborn baby, and negative thoughts such as “I surely will lose the baby this time too.”

The Dohsa-hou practitioner explained that the physical fatigue was likely to exacerbate her negative thoughts, anxiety, and depression. She taught the husband the technique of Dohsa-hou relaxation, and recommended that he provide Dohsa-hou relaxation for his wife at home. Participant A's negative thoughts and ambivalent emotional response to her pregnancy were gradually reduced following the comfortable mind-body experiences induced by Dohsa-hou relaxation.

At 20 weeks, in the second trimester, when Participant A became relaxed by Dohsa-hou relaxation, she felt something move inside of her womb. Because of the psycho-educational explanations about perception of fetal movements, she could understand that that was movements of the fetus, and imagine a healthy fetus growing in her body. Following the perception of fetal movement, her anxiety about having a miscarriage lessened.

At 28 weeks, in the third trimester, frequent fetal movements occurred when Participant A became comfortable with Dohsa-hou relaxation, and she imagined the fetus moving as if it was becoming comfortable, too. The practitioner taught her husband Dohsa-hou relaxation. When he gave her Dohsa-hou relaxation, he perceived the fetal movement under his hand, and he could imagine the fetus as a person. At 33 weeks, when frequent fetal movements occurred during Dohsa-hou relaxation, Participant A confirmed that she now felt that she could become a good mother, and she began to prepare goods for the baby. From 35 weeks, her husband was looking forward to seeing the baby, and talked to and played guitar for the unborn baby.

Change in Maternal Antenatal Emotional Attachment Scale Scores and Self-Rating Depression Scale Scores. As shown in Fig. 1, the quality and quantity scores on the Maternal Antenatal Emotional Attachment Scales increased as Participant A's pregnancy progressed. At the beginning of the first trimester, the quality and quantity scores were low, indicating less attachment to the fetus. However, from the middle of the second trimester to late in the third trimester, both scores increased. In the second trimester, Participant A felt emotionally close to the fetus, imagined the fetus as a person, and dreamed about her unborn baby. And in the third trimester, she said that she desired to meet her baby.

Her scores on the Self-Rating Depression Scale (SDS) indicated that she was depressive at the beginning of Dohsa-hou relaxation. However, the scores decreased rapidly from the first trimester to the second and third (first, 54; second, 36; third, 29), which indicated improvement in her depressive state.

Participant B

Progress of pregnancy. Participant B was a graduate student preparing her master's thesis. She was embarrassed when she learned that she was pregnant, because she was still a graduate student, and her pregnancy was unplanned and unexpected. She believed that her pregnancy was interfering with her studies.

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Participant B had great antipathy toward maternal figures, so that she could hardly accept her own maternity.

The practitioner explained about pregnancy-related stress and its negative effects on becoming motherhood. She advised her not to force acceptance of the pregnancy, but rather to reduce her stress through Dohsa-hou relaxation.

At 12 weeks, in the first trimester, Participant B looked at echo-imaging of the fetus. However, she could neither accept her pregnancy nor imagine a fetus growing inside of her body. Rather, she felt a negative image of the fetus and an impulse to hurt the fetus.

Dohsa-hou relaxation started at 13 weeks. After receiving Dohsa-hou relaxation, Participant B became relaxed, warm, and comfortable, and felt expanding body as if it were a balloon getting inflated. At 15 weeks, during Dohsa-hou relaxation, she felt her body becoming warm from the top of her head to her fingertips. While feeling those positive bodily sensations, her worry about the unplanned and unexpected pregnancy decreased. At 17 weeks, in the second trimester, during Dohsa-hou relaxation, she felt something moving inside her womb. At first, it was difficult for her to determine whether this feeling was gas or fetal movements. But, soon she could perceive it as fetal movements. After she perceived the fetal movements, she was able to accept pregnancy and release herself from negative thoughts about the pregnancy, and her fear of hurting the fetus disappeared.

At 19 weeks, during Dohsa-hou relaxation, Participant B imagined a warm, bright light shining in her head, coming into her abdomen, and evoking comfortable fetal movements.

At 23 weeks, when her husband was doing Dohsa-hou on her abdomen, he perceived fetal movements. The perception of the fetal movements enhanced his attachment to the fetus. He began to think about the name for their unborn baby.

FIG. 2 Quality and Quantity Scores on the Maternal Antenatal Emotional Attachment Scale (MAEAS) Across the Progress of Pregnancy in Participant B

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At 25 weeks, when Participant B felt fetal movements, she imagined the fetus as a person with a human figure.

At 33 weeks, in the third trimester, during Dohsa-hou relaxation, Participant B's husband talked to the fetus. At 36 weeks, during Dohsa-hou relaxation, Participant B felt the fetus moving, and said that it was as if the fetus was enjoying the relaxation.

Change in Maternal Antenatal Emotional Attachment Scale and Self-Rating Depression Scale Scores. As shown in Fig. 2, at the beginning of the first trimester, the quality and quantity scores were at a low level. However, from the middle of the second trimester to late period in the third, these scores increased markedly. In the second trimester, Participant B felt emotionally close to the fetus, and had happy feelings about the fetus, while imagining the fetus. In the third trimester, she felt that the fetus was a person, and she talked to and dreamed about the fetus.

The Self-Rating Depression Scale scores indicated that Participant B was rather depressive in the first trimester, at the beginning of Dohsa-hou relaxation (first, 36). The scores decreased in the first, second, and third trimesters (second, 26; third, 23), which indicates that she moved into a depressive-free state.

Participant C

Progress of pregnancy. Just after registering her marriage, Participant C found out that she was pregnant. The pregnancy was unplanned and unexpected, and she could not accept becoming a mother. In addition, Participant C was criticized by her boss because of her unplanned pregnancy, and she became depressive, and had chronic stiff shoulders and severe lower-back pain.

Dohsa-hou relaxation started from 16 weeks in the second trimester. After receiving Dohsa-hou relaxation, Participant C said that her stiff shoulders and back pain were greatly relieved. At 18 weeks, when she had become comfortable through Dohsa-hou relaxation, she felt something moving inside of her abdomen. Immediately, she understood that this was a fetal movement, and imagined the unborn baby growing inside of womb. Her positive perception of fetal movements lessened the difficulties of accepting her pregnancy and its related problems. But she worried about her boss's attitudes. The practitioner recommended a desensitization technique, in which reducing or neutralizing her boss's angry image through Dohsa-hou induced a comfortable mind-body experience. As she became able to accept the pregnancy, her husband became cooperative in providing her Dohsa-hou relaxation at home.

At 20 weeks, in the second trimester, during Dohsa-hou relaxation on her shoulders, fetal movements occurred. The perception of the fetal movements made it easier for Participant C to imagine the fetus growing inside of her womb.

The practitioner recommended that Participant C tell nursery school children about her pregnancy, explaining that that would make them happy. After getting to school, the children said to the fetus, "Good morning! How are you, baby?" This appeared to help Participant C's boss accept the pregnancy.

At 28 weeks, in the third trimester, frequent fetal movements occurred when Participant C's husband gave her Dohsa-hou relaxation on her abdomen. Touching

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FIG. 3 Quality and Quantity Scores on the Maternal Antenatal Emotional Attachment Scale (MAEAS) Across the Progress of Pregnancy in Participant C

her abdomen to perceive the movement made him happy, and he talked to the fetus, addressing it by name. At 33 weeks, Participant C dreamed that the fetus was looking forward to seeing her.

Change in Scores on the Maternal Antenatal Emotional Attachment Scale and Self-Rating Depression Scale. As shown in Fig. 3, the quality and quantity scores on the Maternal Antenatal Emotional Attachment Scale increased as the pregnancy progressed. The low quality and quantity scores at the beginning of the first trimester indicate that her attachment was at a low level. But, in the middle of the second trimester and late in of the third trimester, Participant C obtained higher attachment scores. In the second trimester, she felt emotionally close to fetus, and dreamed about her unborn baby. Late in the third trimester, she was looking forward to seeing the baby.

The Self-Rating Depression Scale scores indicated that Participant C was depressive at the beginning of Dohsa-hou relaxation (first, 48). However, her scores decreased in the second and third trimesters (second, 34; third, 23), which indicates a lessening of her depressive state.

Participant D

Progress of pregnancy. When Participant D was 5 years old, her parents were divorced. After her mother remarried, physical abuse by her mother and stepfather started. It lasted for 1 year 6 months, until she was taken into protection by a child consultant center. She lived in a children's welfare shelter until her graduation from high school. She got married when she was 20 years old. Her husband was very sympathetic, and accepted her past experiences. She made a strong effort to be a good wife in return for his love. However, she gradually became exhausted and depressive. After she realized that she was pregnant, horrible memories of her past abuse reappeared. She began to blame herself for not being qualified to be a mother. She

had an obsessive thought of hurting her fetus by hitting her abdomen with her fists.

At 14 weeks, in the first trimester, she was referred for Dohsa-hou relaxation to address her antenatal maternal depression. The practitioner explained to Participant D and her husband that her condition was a sign of burnout caused by an excessive effort at becoming an excellent wife and future mother, and that her depressive feelings and memory of the abuse was related to her physical and psychological fatigue. The practitioner explained effects of the husband's emotional support, including Dohsa-hou relaxation, on reducing her abuse-related depression. In addition, the practitioner gave her husband Dohsa-hou relaxation every session, in order to prevent his burn out.

As Participant D's physical and mental fatigue became reduced through Dohsa-hou relaxation, she could gradually understand the relationship between her fatigue and the emergence of negative thoughts and memories of the abuse. At 17 weeks, in the second trimester, during Dohsa-hou relaxation, she felt the fetus moving inside of her womb. She felt immediately that the fetus was very active. This encouraged her to become a good mother. Although this perception of fetal movement brought about maternal-fetal attachment, at other times, when she was tired, she became depressive and suffered from the memory of the abuse.

At 23 weeks, her husband perceived fetal movement when he provided her with Dohsa-hou relaxation. The perception of fetal movement deeply impressed him. At 28 weeks, in the third trimester, Participant D felt the fetus moving its hands and feet as if it were dancing. At 30 weeks, she dreamed about breast feeding her baby. From 34 weeks, she and her husband talked to the fetus while palpitating her abdomen, and were looking forward to seeing the baby as soon as possible.

Change in Scores on the Maternal Antenatal Emotional Attachment Scale and Self-Rating Depression Scale. As shown in Fig. 4, the quality and quantity scores on the Maternal

FIG. 4 Quality and Quantity Scores on the Maternal Antenatal Emotional Attachment Scale (MAEAS) Across the Progress of Pregnancy in Participant D

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Antenatal Emotional Attachment Scale increased from the beginning of the first trimester to the middle of the second, and further increase to late in the third trimester. In the second trimester, Participant D felt emotionally close to the fetus, and dreamed about breast feeding her baby. In the third trimester, she frequently palpitated her abdomen and talked to the fetus.

The Self-Rating Depression Scale scores indicate that she was depressive at the beginning of Dohsa-hou relaxation (first, 63). However, the scores decreased markedly in the second (second, 38) and third trimesters (third, 32).

Discussion

According to Lumley (1982), in the first trimester, pregnant women usually have difficulty describing any attribute or function of the fetus. They express difficulty believing that a baby is really inside them. By the second trimester, particularly after quickening, which occurs at approximately 18 to 20 weeks, they are able to believe that a fetus is living inside them. Eventually, by 36 weeks, they can perceive that the fetus is a person to whom they feel attached.

There is increasing evidence that maternal stress and anxiety during pregnancy are associated with adverse fetal outcomes, including preterm delivery, small for gestational age babies, and behavioral problems in the child (Heron, O'Connor, Evans, Golding, Glover, & the ALSPAC Study Team, 2004). The rate and degree of development of maternal attachment appear to be influenced by gestational age at fetal movement, amount of fetal movement, pregnancy history (such as abortion and miscarriage, planned or unplanned pregnancy, wanted or unwanted pregnancy), and the mother's own history of attachment (Lerum & LoBiondo-Wood, 1989). For example, a woman who has had a miscarriage may avoid becoming attached to the fetus for fear of losing it again.

Women who have had a miscarriage have higher levels of depressive symptoms and pregnancy-specific anxiety than do women with past successful pregnancies and no fetal loss (Armstrong, 2002). Depression also appears to be associated with a lack of planning of the pregnancy.

Lindgren (2001) found that maternal depression was a significant negative predictor of maternal fetal attachment. Feelings of anxiety or depression may interfere with a woman's ability to form an attachment to the fetus. Condon and Corkindale (1997), studying a sample of pregnant women in the third trimester of gestation, found that their level of depressive symptoms was related to their global score and score on the quality sub-scale of the Maternal Antenatal Emotional Attachment Scale. Higher levels of depression and anxiety were associated with a deteriorated quality of prenatal attachment.

In addition, prenatal maternal attachment to the fetus can be influenced by situational and psychological factors. When a pregnancy is planned, social supports are available. When a woman's relationship with her partner is good, the quality of emotional attachment to the fetus increases (Condon & Corkindale, 1997).

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According to Pianta, Egeland, and Erikson (1989), women who broke the intergenerational cycle of maltreatment tended to have someone who had provided them with love and support, which facilitated their personal sense of self worth. Gara, Rosenberg, and Herzog (1996) also found that a positive evaluation of the self and others, and a positive elaboration of childhood memories were associated with a secure attachment. They suggested that mothers who broke the cycle had been able to accept their negative history and positive aspects of themselves.

Konno and Yoshikawa (2003, 2004) found that Dohsa-hou relaxation could bring about positive mind-body experiences. Then, based on those positive experiences, participants' depression, anxiety, negative self-image, and negative cognitive/affective attitudes towards others improved. In all participants in the present study, Dohsa-hou relaxation improved physical problems such as stiff shoulders and lower-back pain, and brought about comfortable mind-body experiences. Thus, Dohsa-hou-induced positive mind-body experiences could reduce depressive feelings, anxieties about unplanned pregnancy and birth, fears of hurting the fetus, and a lowered self-image about becoming a mother. As the participants became comfortable during Dohsa-hou relaxation, they could perceive the fetus moving inside of them, and in turn, the perception of fetal movements facilitated their acceptance of their pregnancy and enhanced the maternal-fetal attachment.

For example, the participant who had had a miscarriage (Participant A) could improve her ambivalent emotional response to her pregnancy, based on the comfortable mind-body experiences from Dohsa-hou relaxation. She could perceive the fetus' movement during Dohsa-hou relaxation, and imagine a healthy fetus growing in her body. After that, her anxiety about a possible second miscarriage disappeared. The participants who had worried about unplanned and unexpected pregnancies (Participants B and C) could accept their pregnancy and release themselves from negative thoughts about it, when they perceived fetal movements during Dohsa-hou relaxation. Participant D was distressed because of a horrible memory of abuse. She blamed herself for not being qualified to become a mother, and was afraid of her obsessive thoughts of hurting her fetus. However, she gradually came to understand the relationship between fatigue and the emergence of negative thoughts and memories of abuse. After perceiving fetal movements, she could get rid of these negative thoughts and form an attachment to the fetus.

The participants in this study received Dohsa-hou relaxation from the practitioner and their partner. Based on the experience of being accepted and supported by the practitioner and their partner, the women could elaborate themselves from a positive perspective, such as an enhanced sense of personal self worth. All the partners who provided Dohsa-hou relaxation perceived fetal movements, and also had enhanced positive cognitive/emotional responses to their partner and her fetus. Then improved paternal-fetal attachment might have improved their marital relations and enabled them to develop cooperative attitudes towards childcare.

Leva-Giroux (2003) has suggested that health-promoting behavior may be an integral part of the process of developing maternal-fetal attachment. As mentioned

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above, Dohsa-hou may serve as a health-promoting support for pregnant women. In addition, their partners' provision of Dohsa-hou relaxation may serve as important social support that may facilitate their sense of worth, sense of being loved, and sense of motherhood, which in turn may enhance the maternal-fetal attachment. Since women's pregnancy-specific depression and anxiety generally appear in the first trimester of gestation (Tsartsara & Johnson, 2006), Dohsa-hou-based health-promoting support for pregnant women, including their partners' social support, should be started from the beginning of the first trimester of pregnancy.

The results of the present study suggest a possible effect of Dohsa-hou relaxation on reducing pregnancy-related stress response and enhancing maternal-fetal attachment through perceiving fetal movements. However, there are several problems that should be further examined.

The first is lack of a control group. The main reason for not including control-group participants was that the participants had urgent needs. Indeed, all the participants in the present study contacted us with urgent needs for help through Dohsa-hou relaxation. The waiting-list or randomized control method are necessary in order to establish a rigorous control group. However, the course of pregnancy is irreversible, so those control methods are considered inappropriate, especially for women who are suffering from pregnancy-related physical complaints or from stress, anxiety, or depression, and who are at high risk of maternal-fetal attachment loss. Because application of the waiting-list method or the randomized control method is difficult, an alternative method is needed to enable a clear evaluation of the effect of Dohsa-hou relaxation. For example, examination of relations between demographic data (e.g., age of the pregnant woman, past miscarriages or abuse, gestational age, complaints) and the effect of Dohsa-hou relaxation is needed.

A second problem is the procedure of recruiting participants. The participants in the present study were spontaneous applicants who had high expectations for the results from Dohsa-hou relaxation, which may have resulted in more improvement. However, pregnant women who have been abused, who are in a lower social class, or who are at high risk of maltreating their own baby, may hesitate to seek social support. Therefore, the present authors plan future research in cooperation with district nurses and gynecologists, in order to develop a support program including Dohsa-hou relaxation for those women.

A third problem concerns the contribution of Dohsa-hou relaxation to preventing the incidence of pregnancy-related developmental disorders. Higher levels of antenatal depression and anxiety are related to less optimal conditions for fetal development, and increase the risk of preterm delivery, small for gestational age babies, and behavioral problems in the child. Maternal stress may cause fetal abuse (e.g., drinking and smoking, irregular life styles, and fetal abuse). Fetal abuse is also a high risk factor for birth of a child with a developmental disorder and subsequent postnatal child abuse (O'Connor, Herron, Glover, & the ALSPAC Study Team, 2002; Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2003).

According to Perry (1997), abuse and neglect in early childhood produces a

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dysregulation of brain function, causing a decrease in cortical and subcortical inhibitory functions mediating attachment and empathy. The accompanying overstimulation of the stress response systems in the midbrain and brain stem produces impulsivity, hyperactivity, and a lower threshold for violence. Therefore, very early intervention for relieving pregnant women's pregnancy-related distress and establishing maternal-fetal attachment is considered an important intervention for lowering the incidence of developmental disorders.

References

- Armstrong, D. S. (2002) Emotional distress and premarital attachment in pregnancy after prenatal loss. *Journal of Nursing Scholarship*, 34, 339-345.
- Bowlby, J. (1982) *Attachment*. Basic Books, New York.
- Bretherton, I. (1985) Attachment theory: Retrospect and prospect. In I. Bretherton & E. Waters (Eds.), *Growing points of attachment theory and research (Monographs of the Society for Research in Child Development)*. University of Chicago Press, Chicago, Illinois, 3-35.
- Condon, J. T. (1993) The assessment of antenatal emotional attachment: Development of a questionnaire instrument. *British Journal of Medical Psychology*, 66, 167-183.
- Condon, J. T., & Corkindale, C. (1997) The correlates of antenatal attachment in pregnant women. *British Journal of Medical Psychology*, 70, 359-372.
- Egeland, B., Jacobvitz, D., & Papatola, K. (1987) Intergenerational continuity of parental abuse. In J. Lancaster & R. Gelles (Eds.), *Biosocial aspects of child abuse*. Jossey-Bass, San Francisco, California.
- Fukuda, K. & Kobayashi, S. (1983) *Japanese version of Self-Rating Depressive Scale*. Sankyobo, Kyoto. (in Japanese)
- Gara, M. A., Rosenberg, S., & Herzog, E. P. (1996) The abused child as parent. *Child Abuse & Neglect*, 20, 797-807.
- Harris, D. B. & Harris, E. S. (1946) A study of fetal movements in relation to mother's activity. *Human Biology*, 18, 221-237.
- Hart, R. & McMahon, C. A. (2006) Mood state and psychological adjustment to pregnancy. *Archives of Women's Mental Health*, 9, 329-337.
- Heidrich, S. M. & Cranley, M. S. (1989) Effect of fetal movement, ultrasound scans, and amniocentesis on maternal-fetal attachment. *Nursing Research*, 38, 81-84.
- Heron, J., O'Connor, T. G., Evans, J., Golding, J., Glover, V., & the ALSPAC Study Team (2004) The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80, 65-73.
- Huizink, A. C., Robles de Medina, P. G., Mulder, E. J., Visser, G. H., & Buitelaar, J. K. (2003) Stress during pregnancy is associated with developmental outcome in infancy. *Journal of Child Psychology and Psychiatry*, 44, 810-818.
- Konno, Y. (2001) Breaking the intergenerational transmission of child maltreatment through establishing early maternal-fetal attachment. *Japanese Journal of Special Education*, 39, 53-59. (in Japanese)
- Konno, Y. (2005) *Tokeai-Dohsa-hou*. Gakusha, Tokyo. (in Japanese)
- Konno, Y. & Yoshikawa, N. (2003) Dohsa-hou based counseling for a woman with

Maternal Attachment Through Dohsa-hou Relaxation

- depression. *Bulletin of the Institute of Clinical Psychology*, 8, 1-9. (in Japanese)
- Konno, Y. & Yoshikawa, N. (2004) Effects of positive bodily experience on the change of depressive states in undergraduates: Using Self-Rating Depression Scale and YG Personality Inventory. *Bulletin of Human Science*, 26, 163-170.
- Konno, Y. & Yoshikawa, N. (2005) Establishment of prenatal attachment through Dohsa-hou: A preliminary intervention for very early prevention of child abuse. *Bulletin of the Institute of Clinical Psychology*, 9, 1-9. (in Japanese)
- Leifer, M. (1977) Psychological changes accompanying pregnancy and motherhood. *Genetic Psychology Monographs*, 95, 55-96.
- Lerum, C. W. & LoBiondo-Wood, G. (1989) The relationship of maternal age, quickening, and physical symptoms of pregnancy to the development of maternal-fetal attachment. *Birth*, 16, 13-17.
- Leva-Giroux, R. A. (2003) Prenatal maternal attachment: The lived experience. Dissertation Abstracts International: Section B: The Science and Engineering, 63, 3656.
- Lindgren, K. (2001) Relationships among maternal-fetal attachment, prenatal depression, and health practices in pregnancy. *Research in Nursing and Health*, 24, 203-217.
- Lumley, J. M. (1982) Attitudes towards the fetus among primigravidae. *Australian Pediatric Journal*, 7, 5-14.
- Mikulincer, M. & Florian, V. (1999) Maternal-fetal bonding, coping strategies, and mental health during pregnancy: The contribution of attachment style. *Journal of Social & Clinical Psychology*, 18, 255-276.
- Ministry of Health, Labour and Welfare (2007) <http://www.mhlw.go.jp/houdou/2007/07/h0710-3.html>
- O'Connor, T. G., Heron, J., Glover, V., & the ALSPAC Study Team (2002) Antenatal anxiety predicts child behavioral/emotional problems independently of postnatal depression. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41, 1470-1477.
- Perry, B. D. (1997) Incubated in terror: Neurodevelopmental factors in the "cycle of violence." In J. D. Osofsky (Ed.), *Children in a violent society*. Guilford, New York, 124-148.
- Pianta, R., Egeland, B., & Erickson, M. F. (1989) The antecedents of maltreatment: Results of the mother-child interaction research project. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. Cambridge University Press, Cambridge, UK, 203-253.
- Pollock, P. H. & Percy, A. (1999) Maternal antenatal attachment style and potential fetal abuse. *Child Abuse & Neglect*, 23, 1345-1357.
- Reading, A. E., Cox, D. N., Sledmere, C. M., & Campbell, S. (1984) Psychological changes over the course of pregnancy: A study of attitudes toward the fetus/neonate. *Health Psychology*, 3, 211-221.
- Ricks, M. H. (1985) The social transmission of parental behavior: Attachment across generations. In I. Bretherton & E. Walters (Eds.), *Growing points of attachment theory and research (Monographs of the Society for Research in Child Development)*. University of Chicago Press, Chicago, Illinois, 211-227.
- Safonova, T. & Leparsky, E. A. (1988) The unwanted child. *Child Abuse & Neglect*, 22, 155-157.

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- Schmeidler, G. R. (1941) The relation of fetal activity to the activity of the mother. *Child Development*, 12, 63–68.
- Sontag, L. W. (1966) Implications of fetal behavior and environment for adult personalities. *Annals of the New York Academy of Science*, 134, 782–786.
- Tsartsara, E. & Johnson, M. P. (2006) The impact of miscarriage on women's pregnancy-specific anxiety and feelings of prenatal maternal-fetal attachment during the course of a subsequent pregnancy: An exploratory follow-up study. *Journal of Psychosomatic Obstetrics & Gynecology*, 27, 173–182.
- Wachter, M. P. K. (2002) Psychological distress and dyadic satisfaction as predictors of maternal-fetal attachment. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 63(4-B), 2080.
- Zeanah, C. H., Carr, S. R., & Wolk, S. (1990) Fetal movement and the imagined baby of pregnancy: Are they related? *Journal of Reproductive and Infant Psychology*, 8, 23–36.
- Zeanah, C. H. & Zeanah, P. D. (1989) Intergenerational transmission of maltreatment: Insight from attachment theory and research. *Psychiatry*, 52, 177–196.

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