# Childbirth and Care Difficulties of Female Kidney Transplantation Recipients

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## ABSTRACT

**Background.** For mothers who experience transplants, pregnancy and childcare can have significant consequences on their quality of life. This study aims to investigate the childcare-related suffering faced by women who gave birth following kidney transplantation.

**Methods.** Data were collected from 65 Japanese kidney transplant recipients from 21 hospitals who had given birth after transplant. The questionnaire included questions concerning the childcare-related suffering of the female kidney transplant recipients. The data were analyzed using KH Coder for the qualitative text mining analysis.

**Results.** The results of the co-occurrence network of words and hierarchical cluster analysis revealed 6 categories that were identified regarding the difficulties in childcare experienced by mothers who gave birth after kidney transplantation: comparing themselves with healthy mothers, parenting priorities, getting tired, not being able to take medicine on time, carefully giving the child a hug, being unable to give breast milk, having regular doctor checkups, and having to leave the child.

**Conclusion.** Recipients experience suffering related to the lifestyle changes that occur as a matter of course during childcare. Recipients are exhausted because of how busy they are with childcare, and they sometimes forget to take their medicine. It is necessary to confirm the living situations of recipients after birth and provide support for their self-management based on their new lifestyles.

RECENTLY, the frequency of pregnancies among kidney transplant patients has increased owing to significant improvements in their health management [1]. However, pregnancy remains a difficult-to-manage issue for recipients of solid organ grafts. Pregnancies after kidney transplantation have become a common outcome, although maternal comorbidity and complications during gestation are more frequent among women with kidney transplantation, thus more often affecting their quality of life compared to controls [2]. At present, more than 1600 kidney transplants are performed annually in Japan [3], and pregnancies among these transplant patients have been increasing [1]. However, preterm deliveries resulting in low birth weight have occurred frequently among these transplant recipients [1,2,4–6]. In addition, kidney transplant recipients frequently report hypertension and other maternal complications such as preeclampsia, allograft loss, and urinary tract infections during pregnancy [2,4,6,7]. Thus, prekidney transplant and prepregnancy counseling for women of childbearing age are increasingly important. Counseling needs to include information regarding contraception, pregnancy, and fertility rates; risk of immunosuppression on the fetus; risk of kidney allograft; maternal complications; and timing of the pregnancy [8]. However, research on the counseling of kidney transplant recipients concerning pregnancy has focused on maternal

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**Table 1. Recipient Characteristics of Study Population (N = 65)**

| | |
|---|---|
| Age at participating in the study: mean ± SD (range), years | 42.0 ± 7.4 (28–67) |
| Age at transplant: mean ± SD (range), years | 28.3 ± 4.6 (16–35) |
| Number of children: mean ± SD (range), n | 1.4 ± 0.7 (1–4) |
| Serum creatinine level at participating in the study: mean ± SD (range), mg/dL | 1.3 ± 1.0 (0.7–8.0) |
| Original disease of end-stage kidney disease: n (%) | |
| Chronic glomerulonephritis | 36 (55.4) |
| Diabetic nephropathy | 2 (3.1) |
| Reflux nephropathy | 2 (3.1) |
| Polycystic kidney disease | 1 (1.5) |
| Systemic lupus erythematosus | 1 (1.5) |
| Hypoplastic kidney | 1 (1.5) |
| Other or unknown causes | 22 (33.8) |
| Dialysis before kidney transplantation: n (%) | |
| Hemodialysis | 50 (76.9) |
| Peritoneal dialysis | 3 (4.6) |
| Both | 4 (6.2) |
| None | 6 (9.2) |
| Unknown | 2 (3.1) |
| Donor source: n (%) | |
| Living | 61 (93.8) |
| Deceased | 2 (3.1) |
| Unknown | 2 (3.1) |
| Comorbidity: n (%) | |
| None | 21 (32.3) |
| Hypertension | 21 (32.3) |
| Hyperlipidemia | 9 (13.8) |
| Diabetes | 4 (6.2) |
| Anemia | 25 (38.5) |
| Other | 1 (1.5) |
| Unknown | 3 (4.6) |
| Obstetric complication: n (%) | |
| No obstetric complications | 23 (35) |
| Pregnancy-induced hypertension | 32 (49) |
| Others | 6 (9.2) |
| Unknown | 4 (6.2) |

Abbreviation: SD, standard deviation.

complications and pregnancy outcomes, whereas the issue of childcare has not been investigated.

Women tend to be burdened with the responsibility of maintaining their health for the sake of their partners, children, and other family members. For mothers who experience transplants, pregnancy and childcare can have significant consequences on their quality of life. Thus, for mothers who have had kidney transplants, the goal is to maintain their health with a donated kidney. This study aims to investigate the childcare-related suffering faced by women who gave birth following kidney transplantation.

## MATERIALS AND METHODS

### Study Design and Participants

This cross-sectional study was conducted from July 2015 to April 2016. Patients who gave birth following a kidney transplant were recruited from among the 200 kidney transplant centers in Japan. Data were collected from 65 female Japanese kidney transplant recipients from 21 hospitals who had given birth after transplantation. The participants met the following criteria: 1. transplant received in Japan; 2. pregnancy and delivery following kidney transplantation; and 3. being assessed as having no physical or psychiatric disorders. During their visit to the outpatient department, the medical staff explained this study and distributed a questionnaire. The questionnaire included questions concerning the childcare-related suffering of the female kidney transplant recipients.

### Data Collection and Analysis

Demographic data were collected via questionnaires, and the results were evaluated. Means and standard deviations were calculated for all demographic data and quantitative parameters, and quality parameters were calculated as percentages. The data were analyzed using KH Coder for the qualitative text mining analysis [9,10]. The study was approved by the Kyoto University Graduate School and Faculty of Medicine Ethics Committee. The study was carried out in accordance with the ethical standards established by the 2000 Declaration of Helsinki and the Declaration of Istanbul 2008.

## RESULTS

A total of 83 female recipients participated in this study. Of these, 65 (78%) returned valid questionnaires. Recipient characteristics are shown in Table 1. The mean age at participating the study was 42.0 ± 7.4 years, and the mean age at the time of the transplant was 28.3 ± 4.6 years. Serum creatinine level at participating the study was 1.3 ± 1.0 mg/dL. The most frequent origin of end-stage kidney disease was chronic glomerulonephritis (n = 36, 55.4%). The most frequent comorbidity of recipients was anemia (n = 25, 38.5%). Maternal age of the total 83 fetal outcomes was 33.8 ± 3.9 years.

There were 1453 total words and 84 total sentences. Analysis of the most frequent words showed that they were: “child,” “breast milk,” “be worried,” “hard,” “physical strength,” and “get tired.” The results of the co-occurrence network of words (Fig 1) and hierarchical cluster analysis revealed 6 categories that were identified regarding the difficulties in childcare experienced by mothers who gave birth after kidney transplantation (Fig 2): comparing themselves with healthy mothers, parenting priorities, getting tired, not being able to take medicine on time, carefully giving the child a hug, being unable to give breast milk and having to leave the child to have regular doctor checkups. Example recipient expressions are: “When my kid cried, I was worried about the side effects of not giving breast milk”; “My immunity is declining, and the cold is being transmitted from the child”; “I could not take my medicine on time”; “I am pretty tired because I have no physical strength”; “When I gave my child a hug, I take care not to let the child bump strongly into my abdomen”; “I go to the hospital frequently, so I have to request for someone to take care of my children”; “Even though I am tired, I can’t stop having to provide childcare every day”; and “I could not consult with a healthy friend.” On the other hand, there was an opinion expressed that parenting is fun, including

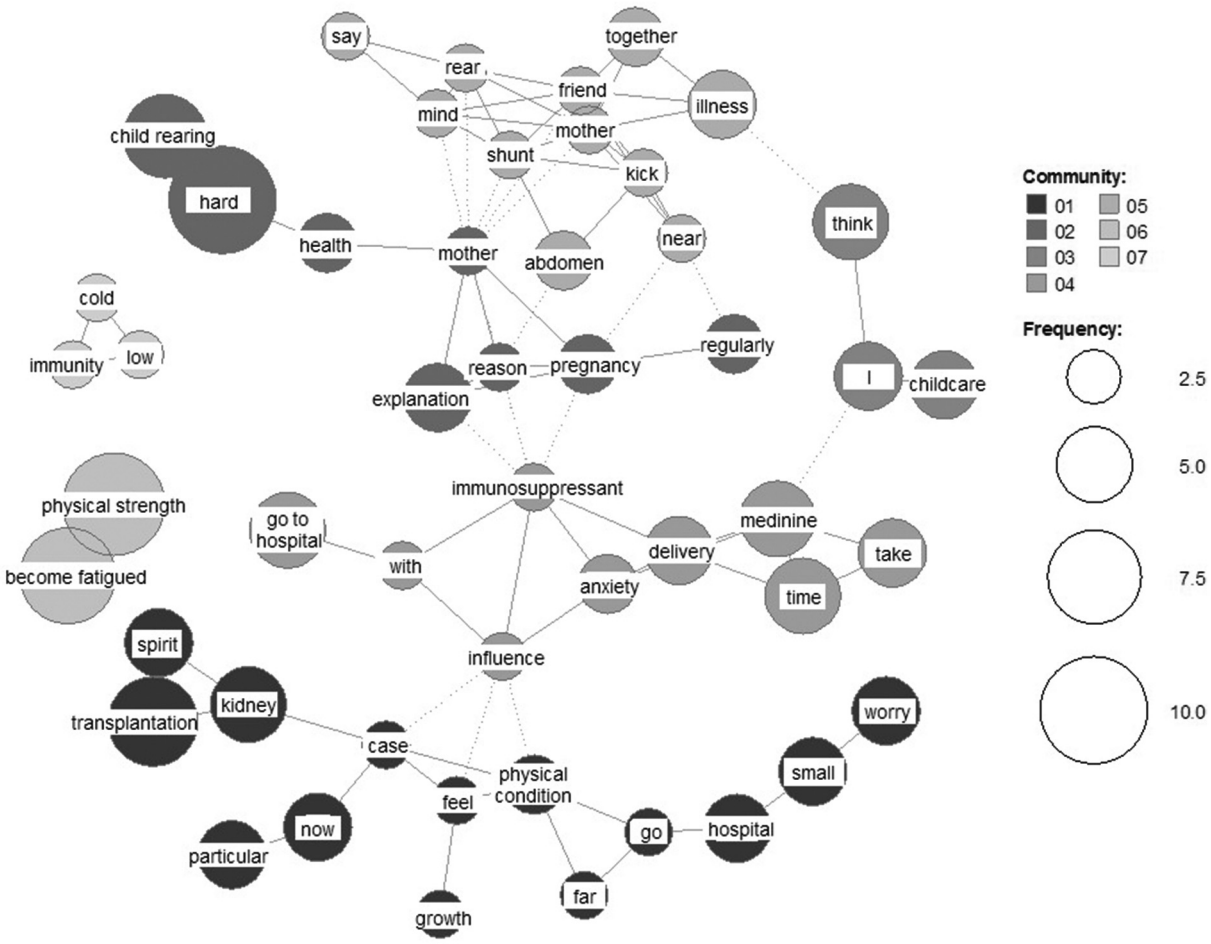


**Fig 1.** The results of the co-occurrence network of words.

thoughts such as: "Nothing was troubling; I enjoyed raising my children" and "Children are growing up healthy. I am grateful for being supported by everyone."

## DISCUSSION

Recipients experience suffering related to the lifestyle changes that occur as a matter of course during childcare. Recipients are exhausted because of how busy they are with childcare, and they sometimes forget to take their medicine.

The mean age at the time of transplant was 28.3 ± 4.6 years in this study. The average maternal age at childbirth was 33.8 years, and there was a fairly long duration from transplant to childbirth. The timing of pregnancy is a concern with respect to the reciprocal influence of the pregnancy on kidney function. If there was a long time period between the transplant and childbirth, the recipient would be over 30 years old when she give birth. Maternal age over 35 is associated with increased congenital anomalies, pregnancy hypertension syndrome, miscarriage, and other risks. In addition, the recipient gets even more tired due to the childcare because their physical strength decreases with age. A pregnancy plan is needed that takes into account the mother's age and physical fitness.

Previous researchers observed that parental stress is strongly related to negative maternal role recognition, and maternal stress is greatly affected by satisfaction with paternal childcare involvement [11]. Furthermore, stress is exacerbated in the case of the birth and care of a first child [11]. In Japan, there is a cultural tendency for fathers to be less involved, while the mother is expected to be wholly responsible for parenting. Thus, to alleviate the compounding stressors experienced by mothers with a renal transplant, fathers need to be more involved with child-rearing duties. In addition, it is especially important to explain the necessary balance between activities and rest.

Moreover, in a recent study, immunosuppressant exposure via breast milk is reported as being likely minimal [12]. Medical staff should explain both the advantages and disadvantages of breastfeeding and breastfeeding options before delivery.

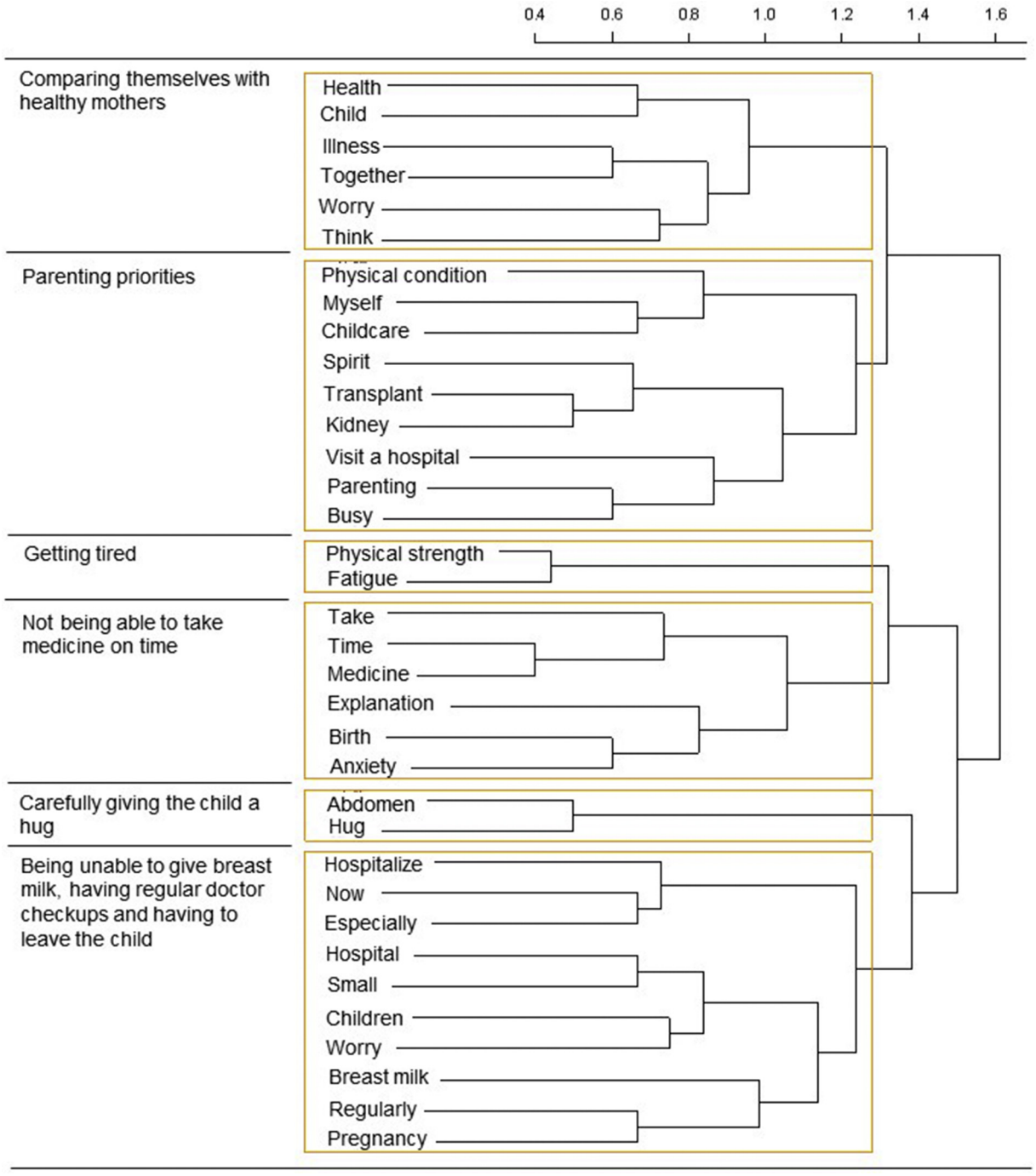


**Fig 2.** The difficulties in childcare experienced by mothers who gave birth after kidney transplantation.

A few limitations of the study should be noted. First, this study is a cross-sectional, retrospective, and multicenter study based on questionnaires to investigate the childcare-related suffering faced by women who gave birth following kidney transplantation. Some recipients enrolled in this study gave birth more than 10 years ago; we could not get patients' detailed data including graft function and urinary albumin excretion before and after the birth from medical reports. Therefore, we could not assess the relationship between the childcare-related suffering and graft condition before and after the birth. This might be a limitation of our study, and future work should obtain a more comprehensive assessment. Second, this study is a simple questionnaire and does not investigate via personal

interview. However, this study clarified the content of care difficulties by recipients, thereby presenting useful suggestions for pregnancy counseling. It is necessary to conduct intervention research based on this research and increase the accuracy and efficiency of pregnancy counseling.

## CONCLUSION

Recipients experienced suffering related to the lifestyle changes that occur as a matter of course during childcare. Recipients are exhausted because of how they are with childcare, and they sometimes forget to take their medicine. The content of pregnancy counseling must be modified according to recipients' situations, they must include childcare, and detailed discussions are needed between medical staff and transplant recipients. It is necessary to confirm the living situations of recipients after birth and provide support for their self-management based on their new lifestyles.

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## REFERENCES

[1] McKay DB, Josephson MA. Pregnancy in recipients of solid organs: effects on mother and child. N Engl J Med 2006;354:1281–93.

[2] Blume C, Sensoy A, Gross MM, et al. A comparison of the outcome of pregnancies after liver and kidney transplantation. Transplantation 2013;95:222–7.

[3] The Japan Society for Transplantation, Japanese Society for Clinical Renal Transplantation. Annual progress report from the Japanese renal transplant registry: number of renal transplantation in 2015 and follow-up survey. Jpn J Transpl 2016;51:124–44.

[4] Chittka D, Hutchinson JA. Pregnancy after renal transplantation. Transplantation 2017;101:675–8.

[5] Deshpande NA, James NT, Kucirka LM, et al. Pregnancy outcomes in kidney transplant recipients: a systematic review and meta-analysis. Am J Transplant 2011;11:2388–404.

[6] Coscia LA, Constantinescu S, Moritz MJ, et al. Report from the national transplantation pregnancy registry (NTPR): outcomes of pregnancy after transplantation. Clin Transpl 2010:65–85.

[7] Fuchs KM, Wu D, Ebcioglu Z. Pregnancy in renal transplant recipients. Semin Perinatol 2007;31:339–47.

[8] Concepcion BP, Schaefer HM. Caring for the pregnant kidney transplant recipient. Clin Transplant 2011;25:821–9.

[9] Higuchi K. A two-step approach to quantitative content analysis: KH Coder tutorial using *Anne of Green Gables* (Part I). Ritsumeikan Soc Sci Rev 2016;52:77–91.

[10] Higuchi K. A two-step approach to quantitative content analysis: KH Coder tutorial using *Anne of Green Gables* (Part II). Ritsumeikan Soc Sci Rev 2017;53:137–47.

[11] Kuwana K, Hosokawa T. The parenting stress felt by parents of 18-month-old children (1) -contributing factors to mother's parenting stress. Annual Bulletin, 56. Graduate School of Education, Tohoku University; 2007. p. 247.

[12] Fitzpatrick A, Mohammadi F, Jesudason S. Managing pregnancy in chronic kidney disease: improving outcomes for mother and baby Int J Womens Health 2016;8:273–85.