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Maternal subjective well-being and preventive health care services in Japan and Finland

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ABSTRACT

Background

Maternal well-being is an important issue not only for mothers but also for their offspring and whole families. This study aims to clarify differences in subjective well-being for mothers with infants and associated factors by comparing Japanese and Finnish mothers.

Methods

In Finland, 101 mothers with infants who received health check-ups at child's age 4 months participated in the study. In Japan, 505 mothers with infants who should receive health check-ups at child's age 4 months and, whose age, age of the infant, and number of children matched with the Finnish mothers were selected. The factors associated with maternal subjective well-being were explored by the linear regression analysis. All Finnish mothers had individual infant health check-ups by nurses in Child Health Clinics nearly monthly. The same nurse was responsible for following up the family throughout the years. All Japanese participants received group health checkup once at child's age 3 to 4 months, and a nurse did not cover same child and their mother.

Results:

Finnish mothers showed significantly better subjective well-being compared with Japanese mothers. Whereas 85% of Finnish mothers responded that they had obtained childcare information from public health nurses, significantly fewer Japanese mothers indicated the same response (8%). Linear regression analyses disclosed that mothers' subjective well-being was associated with country, mothers' stress and age.

Conclusion:

Finnish mothers had better subjective well-being than Japanese mothers. Our results indicate that the Finnish health care system supports mothers better than the Japanese health care

system does.

Key Words: maternal subjective well-being, infant, continuity of care, maternal and child health services, public health nurse

Introduction

Having a child is a time of major psychological, social, and physiological changes in the woman's life. These changes can positively contribute to the life of mother but may also increase psychological and physiological stress. Maternal well-being is important not only for the mother herself but also for her offspring and the whole family. Poor well-being has been found to be related to adverse child outcomes including infant distress and behavior problems.¹⁻³

Japan and Finland share many similarities, such as a very low infant mortality rate and high standard of living.^{4,5} However, there are also many differences which may affect maternal well-being. Since the burst of the Japanese bubble economy in the 1990s, budget reductions in public expenditures on healthcare and welfare services have taken place.⁶ The Japanese society has faced income inequality, educational inequality, and privatization of public services.⁷ The Gini index, a measure of income inequality, ranged from 0.32 to 0.34 during the 1990s and 2000s, which is larger than that of Finland.⁸ Despite the decline in overall mortality rates, socioeconomic inequalities in self-rated health have increased in Japan.⁹ Meanwhile, Finland is classified as a social democratic welfare regime and has maintained this regime for decades.¹⁰ Finland has universal and egalitarian policies, including extensive social and welfare services, and the redistribution of incomes through taxation, leading to small income inequalities. In addition, it has been reported that the percentage of Japanese women working long hours is higher than that of Finnish women.¹¹

Maternal and child health care system may also affect maternal well-being. In Finland, low-risk pregnant women receive 8-9 health check-ups in the Maternity Health Clinics followed by two health check-ups after the delivery. The family receives health check-ups for

the infant in Child Health Clinics on a total of 15 occasions until the child starts the school at seven years of age. These health check-ups are primarily conducted by specialized public health nurses. Based on the background of maternal and child health services, Finland was ranked as the first of mother's index in the state of the worlds' mothers 2014 in a study by Save the Children-organization.¹² In Japan, low-risk pregnant women receive 14 health check-ups in the hospital. After the delivery, children visit a group health check-ups in a health center between 3 and 4 times before the age of 6.

The childcare environment in Finland, with such universal support, is presumably different from the childcare environment in Japan. Therefore, comparing Finnish mothers with Japanese mothers can yield clues for studying effective support in order to ameliorate maternal health status. This study aims to clarify differences in well-being for mothers with infants and associated factors by comparing Japanese and Finnish mothers.

Methods

Study participants

Study participants in Finland were mothers with infants living in Helsinki (the capital of Finland) with a population around 600,000 and approximately 6,700 births yearly.

Prospective participants were asked to cooperate with the study when they participated in the services between January 2014 and December 2015 at the age of 4 months of their offspring.

Those who consented to participate were asked to respond to an online survey. Research cooperation was obtained from 101 mothers. The mean age of these mothers was 32.7 (SD=5.24) years and the mean age of their youngest children was 4.09 (SD=1.34) months and they had, on average, 1.47 (SD=0.70) children. Study participants in Japan consisted of 3,008 mothers with infants who should receive health check-ups at age of 4 months, living in a city,

to whom a postal questionnaire was administered between January and July 2012. The city is located in an urban area with a population of around 453,000 with approximately 4,600 births per year. Responses were obtained from 2,259 Japanese mothers (the response rate of 75%). For purposes of comparison with Finnish mothers, from 2,259 Japanese mothers, 505 mothers whose age, age of children, and number of children matched the Finnish mothers were chosen. Mean age of the Japanese mothers was 32.7 (SD=5.00) years, mean age of their youngest children 3.95 (SD=0.51) months, and mean number of children 1.46 (SD=0.64).

Health care services in Finland and Japan

In Finland, the preventive services at the Maternity and Child Health Clinics are part of municipal primary health care, free of charge for the families, and the drop-out rate is less than 1%.^{13, 14} All infants receive at least 9 health check-ups during the first year of life. The same public health nurse covers the family until the child starts school. Finnish legislation on Maternity and Child Health Clinic services¹⁴ places emphasis on supporting the health of the whole family. Health check-ups emphasize health guidance and advice, which are based on the family's need for support and issues raised by the parents, as well as concerns identified during the check-ups.¹⁴ In addition, extended health check-ups that include the health of the whole family are made twice until the first year of an infant's life: in pregnancy and at 4 months.¹⁴ An on-line Handbook for Child Health Clinics was published in 2014,¹⁵ and this handbook outlines the core principles for the health-promoting work at the clinics. In Japan, services at health check-ups are also part of municipal preventive primary health care and free of charge for the families. The Mother and Child Health Law stipulates that all infants should receive a health check-up once at age 3 to 4 months. The drop-out rate is less than 5%. Generally, pediatricians at regional public health centers perform routine medical check-ups as a group examination, and public health nurses are responsible for mother consultations on

child rearing at that time but not supporting the health of the whole family. Except for special cases concerning about possible child maltreatment, public health nurses do not cover same child and their mother.

Measurement

Maternal subjective well-being was evaluated according to 5 grade self-rating scale of 5 (excellent) to 1 (poor). Participating mothers were asked to indicate the sex of subject infant, birth weight, gestational age, abnormality during pregnancy, maternal and paternal age, age of subject infant, number of children, nature of pregnancy (planned or unplanned), sources of childcare information, maternal state of sleep, subjective well-being, stress state, postnatal depression, and mothers' perceptions relating to partner relationships and family support network. The items of partner relationships included dividing household chores flexibly and fairly, sharing childcare responsibilities, and being intimate as husband and wife. The items of family support network included being able to get help from grandparents when necessary, having neighbours and acquaintances who can help if needed, being able to get support from other families with children, being able to get help for babysitting, and existence of sufficient services for families with children in the residential environment. Mother's stress was evaluated using a visual analogue scale (VAS) which designed to measure the mother's self-rating of their stress state. Presented with a vertical line, the end points represented "no stress" at 0, and "great stress" at 10. Postnatal depression was assessed with the Edinburgh Postnatal Depression Scale (EPDS).¹⁶ For each of the items on mothers' perceptions relating to partner relationships and family support network, responses were scored as follows: "agree" (4 points), "partially agree" (3 points), "partially disagree" (2 points), and "disagree" (1 point). We made sure that the study questions were as comparable as possible between Japan and Finland before starting the data collection by translating Japanese and Finnish

questionnaire into English and translating Finnish questionnaire into Japanese by different translators.

Statistical analysis

The differences in the mean values except mothers' perceptions relating to partner relationships and family support network were examined using the t-test. The distributions of mothers' perceptions relating to partner relationships and family support network did not observe a normal distribution. Accordingly, we used a Mann-Whitney U test when studying group differences in these two variables. The independence of categorical variables was examined using χ^2 -analysis. Further, the factors associated with maternal subjective well-being were explored by the linear regression analysis. We fitted separate models for maternal subjective well-being in Finnish and Japanese mothers, only Finnish mothers, and only Japanese mothers as dependent variables. The independent variables were sex of subjective infant, birth weight, gestational age, abnormality during pregnancy, maternal age, number of children, nature of pregnancy, childcare information (parenting groups, friends who have children, public health nurses), score of stress state, EPSSD scores, sleeping hours and mothers' perceptions relating to partner relationships (dividing household chores flexibly and fairly, taking turns caring the baby) and family support network (being able to get help from grandparents when necessary, existence of sufficient services for families with children in the residential environment). Moreover, the independent variables in model 2 for Finnish and Japanese mothers included country. For the nominal-level variables, the following codes were used: sex, boy=0, girl=1; abnormality during pregnancy, yes=0, no=1; nature of pregnancy, unplanned=0, planned=1; childcare information from persons, no=1, yes=1. We also tested the country interaction effect for each variable. All statistical analyses were performed using IBM SPSS version 23.0 for Windows.

Ethical considerations

We informed the participants that their participation in the study was voluntary, that no disadvantage would occur if they did not cooperate with the study, and that the return of the anonymous self-administered questionnaire would be taken as consent to participate in the study. The study protocol was approved by the Ethics Committee of the National Institute for Health and Welfare (THL) in Finland and Osaka City University in Japan.

Results

Table 1 provides the basic characteristics of Finnish and Japanese mothers. The Finnish infants were heavier at birth than Japanese infants. Finnish mothers had a lower rate of abnormality during pregnancy than Japanese mothers. The rate of planned pregnancy was higher in Finnish than in Japanese mothers.

No difference was observed between the proportion of Finnish and Japanese mothers who responded that they obtained information about childcare from childcare books and magazines (Table 2). However, whereas 85% of Finnish mothers responded that they had obtained information from public health nurses, much fewer Japanese mothers indicated the same response (8%; $p < 0.001$). In addition, Finnish mothers showed better subjective well-being compared to Japanese mothers ($p < 0.001$). Comparison of mothers' sleeping hours found that mean sleeping hours for Finnish mothers was 7.41 (SD=1.22) and 6.42 (SD=1.12) for Japanese mothers ($p < 0.001$).

Regarding partner relationships, the perception of dividing household chores ($p < 0.001$) and sharing childcare responsibilities ($p < 0.001$) was higher for Finnish than for Japanese

mothers (Table 3). Furthermore, the scores were higher among Finnish than Japanese mothers with regard to the perception of existence of sufficient services for families with children in their residential environment ($p < 0.001$). Conversely, in the perception of being able to get help from grandparents when necessary, scores were higher among Japanese than among Finnish mothers ($p < 0.001$).

Table 4 shows the results of linear regression analysis on maternal subjective well-being with associated factors as independent variables. In model 1 for Japanese and Finnish mothers, childcare information from public health nurses and the score of stress state were associated with maternal subjective well-being. Moreover, the age of mother and the sex of subject infant were associated with maternal subjective well-being. Abnormality during pregnancy and being able to get help from grandparents when necessary were also associated with maternal subjective well-being. However, the association between information from public health nurses and subjective well-being was non-significant when separating Japanese and Finnish mothers, while the association between the score of stress state and subjective well-being remained significant. In model 2, country and the other factors detected in model 1, excluding childcare information from public health nurses, were associated with maternal subjective well-being. In Finnish mothers, the perception that household chores should be shared by couples were associated with maternal well-being. None of the country interactions were statistically significant.

Discussion

The findings of this study revealed that Finnish mothers have significantly better subjective well-being than Japanese mothers. Self-rated health is interpreted as a global measure of well-being.¹⁷ Linear regression analyses disclosed some factors associated with mothers'

subjective well-being. The first factor related to country: the Finnish mothers rated their well-being better than Japanese mothers. All Finnish participants had individual infant health check-ups with nurses in Finnish Maternity and Child Health Clinics almost monthly. The same nurse is responsible for following up the family throughout the years from early pregnancy until the child reaches school age. Such a continuing relationship between the nurse and family has been indicated to be in relation with parents' positive experiences regarding received professional support^{18,19} and it can well contribute to the better well-being of Finnish mothers. Moreover, it has been reported that the relational continuity of care support parents self-efficacy beliefs even if parents have depressive symptoms.²⁰ Childcare counselling is a part of these check-ups in Finland, and nurses provide information to mothers using the “*We are having a baby*” guidebook.²¹ Public health nurses also use this booklet to give guidance not only on childcare but also how to cope with maternal depression and other aspects to improve maternal health. Meanwhile, in Japan, all participants received health check-ups once when the infant was 3 to 4 months of age. Public health nurses did not cover same child and their mother. In the present study, only 8% of Japanese mothers had received childcare information from public health nurses, as compared with more than 85% in Finnish mothers. These large differences may explain why information from public health nurses was associated with maternal subjective well-being in this study only when analyzing Finnish and Japanese mothers together, while the effect disappeared when looking separately at mothers from Finland and Japan. Since the stable contact with public health nurses is largely universal in Finland and rare in Japan, the effect of information from public health nurses may be seen as reflecting country, but not explicitly as the effect of this specific variable on maternal subjective well-being.

The results of the present study found that mothers' stress scores were related to their

subjective well-being. Excessive crying or feeding problems during infancy are found in approximately 20% of infants.²² These problems can have a negative impact on maternal well-being. A study of new mothers in Sweden found that factors associated with poor self-rated health included negative experiences of breast feeding and poor social support.²³ These factors might be a cause of maternal stress. It is also possible that poor self-rated health is related to birth related stress.²⁴ Further studies are needed to investigate factors mediating the effect of maternal stress on their subjective well-being.

Mothers' age was also found to be related to subjective well-being in this study. It is indicated that advanced maternal age is a risk factors of a range of obstetric morbidities including gestational diabetes and hypertensive disorders.²⁵ Moreover, Nilsen et al.²⁶ reported that women who had their first baby at an advanced age have more age-related physical health problems as well as fatigue and sleeping problems. It is therefore essential to consider mothers' well-being especially when they are older.

Tychev et al.²⁷ reported that the sex of infant has an influence on the mental and physical well-being of mothers; more specifically, mothers' well-being was more adversely affected with boys than with girls. The results of the present study also revealed that the sex of infant is related to mothers' subjective well-being and that mothers' subjective well-being was more negatively affected with boys. The reasons for this sex-based difference are unclear, and further research is needed to elucidate the relationship.

Abnormality in pregnancy was also found to be related to mothers' subjective well-being. Poor mental and physical well-being during pregnancy are reported to be risk factors for depression during this period.²⁸ Furthermore, mothers who experience depression during

pregnancy have higher probability of experiencing postpartum depression after childbirth.²⁹ This suggests that mothers who experience any mental or physical disturbances during pregnancy require additional care for their well-being after childbirth.

Lastly, it was found that mothers' subjective well-being was related to their awareness of the availability of help from grandparents when necessary. Mothers in Japan scored significantly higher for this awareness than mothers in Finland, suggesting that help from grandparents has a clearer influence on Japanese mothers' subjective well-being. A Taiwanese study³⁰ reported that mothers who had support from their own mother after birth experienced fewer depressive symptoms than those who did not receive such support. It has been speculated, therefore, that in Asian cultures, the role of the infants' grandparents in providing childcare support is especially important. Meanwhile, the mothers in Finland scored significantly higher in their awareness of dividing household chores flexibly and fairly than those in Japan, and this awareness was related to their subjective well-being. Seimyr et al.³¹ reported that partners of depressed women were neither more involved in family support nor did they utilize paternal leave more than the other men. Dividing household chores flexibly and fairly in partner relationship in Japan in the future may improve maternal well-being and thus have beneficial effects for the whole family.

Our study has both strengths and weaknesses. Our main strength is that as the collaboration was started already before the data collection we could harmonize the questionnaires and study protocol to maximize the comparability. We also selected Japanese mothers that matched the Finnish mothers. However, this does not prevent the possibility that because of cultural differences, the participants have interpreted the questions differently. Our sample size was large enough to demonstrate main effects, but when studying country interactions we

need a bigger sample size.

In conclusion, this study showed that Finnish mothers had significantly better subjective well-being than Japanese mothers. Only 8% of Japanese mothers had received such information from public health nurses, compared with more than 85% of Finnish mothers. Differences of preventive health care system between Finland and Japan may affect maternal subjective well-being, but more research is needed.

Words:2966

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Conflict of interest: None declared.

Key points

- Finnish mothers with infant showed significantly better subjective well-being compared to Japanese mothers with infant.
- Comparison of mothers' sleeping hours found that mean sleeping hours for Finnish mothers was significantly longer, approximately one hours, than that for Japanese mothers.
- Whereas 85% of Finnish mothers responded that they had obtained childcare information

from public health nurses, significantly fewer Japanese mothers indicated the same response (8%).

·Our results indicate that maternal subjective well-being might be improved by the relational continuity of care of public health nurses.

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Table 1. Characteristics of Finnish and Japanese mothers

	Finnish mothers	Japanese mothers	P-value
	n (%)	n (%)	
Age of father			
Mean±SD	33.83±5.80	34.43±6.09	n.s.
Sex of subject infant			
Boys	48 (47.5)	266 (52.7)	n.s.
Girls	53 (52.5)	239 (47.3)	
Birth weight (g) of subject infant			
Mean±SD	3440.6±502.4	3008.1±443.5	P=0.002
Gestational age (weeks) of subject infant			
Mean±SD	39.5±1.62	38.9±1.84	P<0.001
Abnormality during pregnancy	44 (43.6)	291 (57.6)	P=0.012
Gestational diabetes mellitus	12 (11.9)	12 (2.4)	P<0.001
Pregnancy induced hypertension	10 (9.9)	15 (3.0)	P=0.004
Anemia of pregnancy	10 (9.9)	104 (20.6)	P=0.012
Hyperemesis	18 (17.8)	64 (12.7)	n.s.
Threatened abortion	2 (2.0)	33 (6.5)	n.s.
Premature delivery	4 (4.0)	46 (9.1)	n.s.
Nature of pregnancy			
Planned	89 (88.1)	333 (55.1)	P<0.001
Unplanned	12 (11.9)	170 (33.8)	

Table 2. Comparison of the source of childcare information and health status between Finnish and Japanese mothers

		Finnish mothers n (%)	Japanese mothers n (%)	P-value
Information from persons				
	Parenting groups	21 (20.8)	24 (4.8)	P<0.001
	Friends who have children	89 (88.1)	383 (75.8)	P=0.006
Childcare information	Public Health Nurses	86 (85.1)	39 (7.7)	P<0.001
Information from materials				
	TV	15 (14.9)	161 (31.9)	P<0.001
	Books/magazines on childcare	73 (72.3)	325 (64.4)	n.s
	Internet	85 (84.2)	349 (69.1)	P=0.002
Maternal subjective well-being ¹⁾		4.27±0.78	3.83±0.82	P<0.001
Health status	Sleeping hours ¹⁾	7.41±1.22	6.42±1.12	P<0.001
	Score of Stress state ¹⁾	3.81±2.08	3.63±2.13	n.s
	EPDS ¹⁾	5.22±3.63	4.64±3.55	n.s

1)Mean±SD

Table 3. Comparison of partner relationship and family support network between Finnish and Japanese mothers

	Finnish mothers Mean±SD	Japanese mothers Mean±SD	P-value
Partner relationship			
Dividing household chores flexibly and fairly	3.25±0.85	2.87±1.02	P<0.001
Sharing childcare responsibilities	3.51±0.69	2.93±0.92	P<0.001
Being intimate as husband and wife	3.71±0.59	3.59±0.63	n.s.
Family support network			
Being able to get help from grandparents when necessary	3.11±0.97	3.50±0.80	P<0.001
Having neighbours and acquaintances who can help us	2.77±0.98	2.78±1.07	n.s.
Being able to get support from other families with children	3.12±0.95	3.12±1.00	n.s.
Being able to get help with babysitting	3.27±0.88	3.18±0.93	n.s.
Existence of sufficient services for families with children in our residential environment	3.58±0.65	3.03±0.81	P<0.001

Table 4. Result of linear regression analysis of factors associated with maternal subjective well-being

Dependent variable		<u>Finnish and Japanese mother (model 1)</u>			Interaction effect	<u>Finnish and Japanese mother (model2)</u>		
variable	Independent variable	Beta	95% CI	P- value	for country	Beta	95% CI	P-value
Maternal Subjective well-being	Childcare information from nurses ¹⁾	0.13	0.09, 0.44	P=0.003	P=0.136	0.15	-0.16, 0.79	P=0.187
	Score of stress state	-0.36	-0.17, -0.11	P<0.001	P=0.746	-0.34	-0.21, -0.04	P=0.006
	Age of mother	-0.12	-0.04, -0.01	P=0.004	P=0.744	-0.11	-0.03, 0.01	P=0.011
	Sex of subject infant	0.94	0.03, 0.28	P=0.015	P=0.155	0.09	0.03, 0.28	P=0.018
	Abnormality during pregnancy	0.15	0.12, 0.38	P<0.001	P=0.947	0.16	0.14, 0.40	P<0.001
	Being able to get help from grandparents	0.09	0.01, 0.17	P=0.028	P=0.605	0.11	0.03, 0.19	P=0.006
	Country						-0.20	-0.70, -0.18
		<u>Finnish mother</u>				<u>Japanese mother</u>		
Maternal subjective well-being	Childcare information from nurses ¹⁾	0.15	-0.15, 0.83	P=0.167		-0.01	-0.29, 0.24	P=0.845
	Score of stress state	-0.35	-0.21, -0.04	P=0.006		-0.38	-0.18, -0.11	P<0.001
	Age of mother	-0.08	-0.05, 0.02	P=0.498		-0.12	-0.04, -0.01	P=0.010
	Sex of subject infant	0.16	-0.08, 0.55	P=0.146		0.09	0.01, 0.29	P=0.035
	Abnormality during pregnancy	0.06	-0.25, 0.41	P=0.619		0.17	0.14, 0.43	P<0.001
	Being able to get help from grandparents	0.09	-0.10, 0.24	P=0.426		0.11	0.03, 0.21	P=0.013
	Dividing household chores fairly	0.29	0.04, 0.47	P=0.019		-0.08	-0.17, 0.03	P=0.154

1) nurses: public health nurses, Excluding variables that are not significant.